

DPers Chase 'the Blues,' EDSF for \$18 Million

By Bill Laberis
CW Staff

DES MOINES, Iowa — Dante Vignaroli got an unexpected greeting when he walked into work at the Blue Cross/Blue Shield office here one September morning two years ago. The medical insurer had decided to let Electronic Data Systems Federal Corp. run its in-house DP operation.

Along with about 160 other DP department employees, Vignaroli was given the choice of working for EDSF, which had been granted a 10-year contract, or being laid off with no severance pay.

The employees were given 24 hours to make a decision.

Vignaroli, a senior systems analyst who was earning \$24,000 annually, accepted the EDSF offer, which Blue Cross/Blue Shield said would provide comparable pay, title and benefits.

Now, two years later, Vignaroli and several of his former co-workers have filed an \$18 million suit charging that Blue Cross wrongfully denied them severance pay. They have also charged that three-quarters of the 160 DPers have either been fired by EDSF or forced to leave the company.

The class action suit, which names both Blue Cross/Blue Shield and EDSF as defendants, was filed on behalf of all 160 DPers. To date, 49 of these former Blue

Cross employees have contributed money to fund the litigation, according to David Shinkle, attorney for the plaintiffs. Shinkle expects many others to follow.

A spokesman at EDSF's Dallas headquarters reserved comment on the pending suit until he could speak with company attorneys.

A Blue Cross spokesman said he, too, could not comment on any specific aspects of the pending case. He did say, however, that the 160 DPers were given no indication of the imminent job changes. This nondisclosure "was the product of a management evaluation [designed] to avoid any sabotage or security

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COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

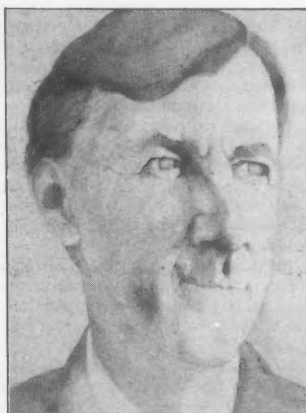
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NEWSPAPER



IN DEPTH: James Martin

In an exclusive interview, industry guru James Martin talks about the data base environment, including current development tools, structured methodologies, IBM's data base strategy, Japan's software efforts and information engineering. Interview follows Page 56.

Also in In Depth, an excerpt from Martin's just-published book Strategic Data Planning Methodologies.

B4900 Replaces B4800 Series

Burroughs Starts New CPU Line

By Tom Henkel
CW Staff

DETROIT — Burroughs Corp. last week replaced its aging B4800 line of upper end mainframes by bringing out the B4955, the first in a new line of processors.

The company also took the wraps off the B5920, an entry-level addition to its mid-range B5900 line of processors, and announced a line of software conversion aids that reportedly help IBM, Sperry Univac and Honeywell, Inc. users migrate to its B5900, B6900 and B7800 processor series (see story on Page 8).

The newly introduced B4955 offers up to 1.8 times the performance of the B4800 that it replaces, according to Burroughs. The mainframe employs a distributed pipeline processing architecture that allows various steps in the processing task to be performed concurrently, a spokesman noted.

In addition, the B4955 features four-port memory control, which allows a four-way interleaved memory access.

Burroughs has been informally talking about the B4900 series of processors for at least two years. The B4955 is an upgrade for users of B2000, B3000 and B4000 series com-

puters, the vendor said.

The B4955 is available in either single-processor or multiprocessor configurations. Up to four processors can be connected through a Shared System Processor that allows the four processors to share common disk resources. According to Burroughs, this provides increased processing power and continuous availability of data processing resources.

The B4955 is available with 5M bytes of main memory, but Burroughs' press release on the B4900 series indicated that 10M bytes of main memory will be available in 1983. Main memory is comprised of four separate interleaving memory modules, offering a memory bandwidth rate of 50M byte/sec, Burroughs said.

The B4955 takes up about 65% less

(Continued on Page 8)

The People Who Promote DPers Say Work Quality Critical Factor

By Jim Bartimo
CW Staff

FRAMINGHAM, Mass. — More important by far than length of service, quantity of work or educational background, quality of work is the most critical factor in the promotion of data processing professionals.

Sixty-nine percent of the 16 respondents to an informal Computerworld telephone survey of high-level DP executives cited ability, performance and quality of work as top priorities when considering a candidate for promotion.

"Basically, length of service is one of the last things I consider," said

N.A. Sorenson, director of information systems and services for Hunt-Wesson Foods, Inc. of Fullerton, Calif. "It's whether they're producers. Others know who the producers are."

"There are some people who have been here a long time in the same position and that's fine, too," he said, but that is not a criterion for promotion.

"Formal education isn't as important as acquired background through experience," according to James Burns, vice-president and director of corporate data services for Houghton

(Continued on Page 9)

By Lois Paul
CW Staff

LOS ANGELES — "We would go to reference our production JCL and it would be gone. We would have to rebuild it."

That is how Norma Ann Dodd, a systems programmer with Blue Cross/Blue Shield of Alabama, explained a problem that apparently is affecting many sites where

multiple users of IBM's MVS operating system are attempting simultaneous updates of partitioned data sets (PDS). For the Alabama user this problem would show up on very active PDS, such as JCL or procedure libraries. Because of the current design of the MVS operating system's Open and Close facilities, it is possible for the second person updating a

PDS PROBLEMS HIT



library to overwrite the update that is being done at the same time by another person.

"We have lost countless hours of programmer time because of this situation," said George Simon, a performance analyst with Reliance Insurance Co. in Philadelphia. "Let's say somebody saves something after me. He

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Please address all correspondence to the appropriate department at Box 880, 375 Cochituate Road, Framingham, Mass. 01701. Phone: (617) 879-0700. Telex: 95-1153.

OTHER EDITORIAL OFFICES:
New York City: Suite 7G, 401 East 80th St., New York, N.Y. 10021. Telephone: (212) 570-2135.

West Coast: 257 Lytton Ave., Palo Alto, Calif. 94301. Phone: (415) 328-8064.

Washington, D.C.: 880 National Press Building, 529 14th St. N.W., Washington, D.C. 20045. Phone: (202) 347-6718.

England: Richard Hease, ECC Publications, 30-31 Islington Green, London N1. Phone: (01) 359-7481.

W. Germany: Eckhard Updehl, CW Publications, Friedrichstrasse 31, 8000 Munich 40. Phone: (089) 34-90-61. Telex: 5215350.

France: Patrick Morel, Le Monde Informatique, 42, Avenue Montaigne, 75008 Paris. Phone: 720 85 66.

Asia: Mr. Shohel Kurta, Computerworld Japan, 1-19-7 Shintomi, Chuo-ku, Tokyo 104. Phone: (03) 551-3882. Telex: 252-4217.

Australia: Alan Power, Computerworld Pty. Ltd., 37-43 Alexander Street, Crows Nest, NSW 2065. Phone: (02) 4395133. Telex: SECCO AA25468.

Brazil: Eric Hippau, Data News, Computerworld do Brasil, Servicos e Publicacoes Ltda., Rua Alcindo Guanabara, 25/10th Floor 20031 Rio de Janeiro, RJ Brazil. Phone: (021) 240-6225. Telex: 2130838(WORD BR).

Mexico: Richard Small, Computerworld de Mexico, Oaxaca 21-2, Colonia Roma, Mexico City 7 D.F. Phone: (905) 514-4218. (905) 514-6309.

Spain: Neil Kelley, Computerworld/Espana, Barquillo, 38, Madrid-4.

Denmark: David R. Rouse, Computerworld/Denmark, Gammel Strand 50, 1202 Copenhagen K. Phone: 01-1234-11. Telex: 27566 cwdan.

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'Assist' Trims CPU Time

Amdahl Backs MVS/SP 3.0 Users

By Jeffery Beeler

CW West Coast Bureau

SUNNYVALE, Calif. — Users of mainframes that run under MVS/SP Version 1 Release 3.0 can reportedly trim their overall CPU use by as much as 10% with a licensed program product announced here last week by Amdahl Corp.

MVS/SP Assist is said to contain software routines that, in effect, add the 370 Extended Facility, 3033 Extended Feature and 3033 Extended Addressing instructions to MVS/SP Version 1 Release 3.

The result of this addition is that the IBM operating system needs no extended facilities to execute programs on 370 series machines or on Amdahl 470V/7 and V/8 processors, the spokesman said.

MVS/SP Assist was one of three system software modules that joined Amdahl's family of licensed program products last week. The other two

additions include an "accelerator" for IBM's Conversational Monitor System (CMS) and a second release of Amdahl's Universal Timesharing System (UTS), which enhances Bell's Unix Version 7.0.

MVS/SP Assist is described as a functional replacement for MVS/SE Assist Release 3.0. In an IMS environment, MVS/SP Assist reportedly provides 12% better supervisor-state CPU use and 10% better total CPU use than MVS/SE Assist Release 3. In a CICS setting, by contrast, the edge in supervisor CPU time and total CPU time is 12% and 3%, respectively.

MVS/SP Assist also supports Amdahl's 470 Extended Addressing feature, which allows V/7 and V/8 systems to be configured with up to 32M bytes of real storage, the spokesman said.

Amdahl also provided some technical specifications for CMS/Accelera-

tor [CW, Sept. 20]. Dubbed CMS/XL, the software operates in VM/SP environments and reportedly cuts the overhead typically associated with heavy CMS use.

Key performance features include a Load Module Assist facility and a Console Output Batching capability. The first of these two user features is said to minimize contention by allowing frequently used modules to be retrieved from shared virtual storage rather than from shared system disk units, the vendor spokesman explained.

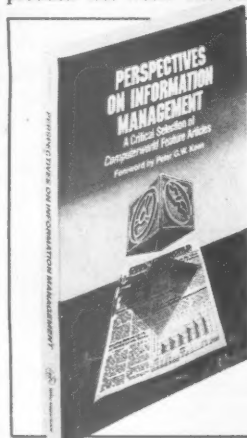
The second feature reportedly cuts the number of I/O operations involved in processing output for CMS user consoles.

UTS Release 2.0, meanwhile, runs under either VM/370 or VM/SP and reportedly enhances Amdahl's existing UTS version with features such as:

- An improved C compiler and Unix system kernel.
- Fortran 77 and Pascal 8000 compilers.
- Support for remote IBM 3270 and 3270-compatible terminals.
- Support for IBM 3278 large-screen display units.
- A paging capability that expands the number of users who can gain access to a common copy of UTS.

For each processor, MVS/SP Assist and the CMS/Accelerator can be installed for a yearly fee of \$3,150 and \$7,500, respectively. UTS Release 2, meanwhile, sells for \$10,500/year for academic users and \$15,750/year for nonacademics.

All three program products can also be paid for in monthly installments and are available now from Amdahl at 1250 E. Arques Ave., Sunnyvale, Calif. 94086.



John Wiley and Sons, Inc. and Computerworld are proud to announce the publication of Perspectives on Information Management: A Critical Selection of Computerworld Feature Articles. The 480-page book is a collection of 38 articles which first appeared in CW's "In Depth" section or in Computerworld Extra!

The articles span areas of interest that include software, hardware, communications, management, legal issues and others. Among the authors are Martin A. Goetz, John S. Mayo, Harold S. Bott, Ronald G. Ross and CW Managing Editor Rita Shoor.

The book is available in bookstores nationwide for \$19.95. It can also be ordered from E.A. Connor, John Wiley & Sons, 605 Third Ave., New York, N.Y. 10157.

This Week

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(a) 46; (b) 48; (c) 50.

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|------------------------------------|-------------------------------|
| 1. Exxon | 26. Chrysler |
| 2. Mobil | 27. Union Oil of California |
| 3. General Motors | 28. Eastman Kodak |
| 4. Texaco | 29. Dart & Kraft |
| 5. Standard Oil of California | 30. Union Carbide |
| 6. Ford Motor | 31. Boeing |
| 7. Standard Oil (Indiana) | 32. R. J. Reynolds Industries |
| 8. International Business Machines | 33. Amerada Hess |
| 9. Gulf Oil | 34. Westinghouse Electric |
| 10. Atlantic Richfield | 35. Ashland Oil |
| 11. General Electric | 36. Marathon Oil |
| 12. E. I. du Pont de Nemours | 37. Caterpillar Tractor |
| 13. Shell Oil | 38. Goodyear Tire & Rubber |
| 14. International Tel. & Tel. | 39. Cities Service |
| 15. Phillips Petroleum | 40. LTV |
| 16. Tenneco | 41. Beatrice Foods |
| 17. Sun | 42. Xerox |
| 18. Occidental Petroleum | 43. Philip Morris |
| 19. U.S. Steel | 44. RCA |
| 20. United Technologies | 45. McDonnell Douglas |
| 21. Standard Oil (Ohio) | 46. International Harvester |
| 22. Getty Oil | 47. Bethlehem Steel |
| 23. Dow Chemical | 48. Rockwell International |
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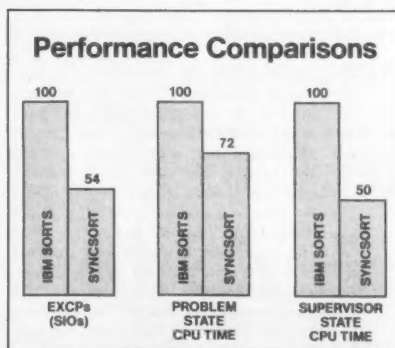
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But Plans to Replace System

N.H. Averts \$33 Million Suit Filed by Andersen

By Bill Laberis
CW Staff

CONCORD, N.H. — The New Hampshire State Liquor Commission (SLC) will soon begin installing a computer system it will lease for \$320,000 per year. The system will replace one the commission bought for over \$2 million three years ago, but which never operated as planned.

And in the face of a \$33 million civil suit, state officials and a state-appointed consultant have retracted the damning comments they reportedly made last year about Arthur Andersen and Co., the Boston-based accounting firm hired in 1979 to help straighten out the SLC's fiscal woes.

Andersen filed the \$33 million suit last January after published reports quoting the SLC's commissioners and a DP consultant surfaced in various newspapers, including *Computerworld* [CW, Nov. 2]. The reports painted a picture of a state that had poured millions down the DP drain at Andersen's urging, only to be left with a system that was outdated and inoperable.

In July, DP consultant Richard Newbert and the SLC's three commissioners signed statements testifying that Andersen had always acted with integrity and professionalism in executing its service contract with the SLC. Newbert added that any statements to the contrary and attributed to him were false "and are retracted."

In return, Andersen dropped its suit.

Jean Wallin, chairwoman of the SLC's board of commissioners, refused to say just how much the state had spent trying to get the system installed and running according to specifications. She referred such questions to the New Hampshire Attorney General's office, which originally had referred the questions to

Wallin's office.

Newbert's attorney said he could not comment on behalf of his client because of a nondisclosure agreement reached with Andersen over the summer.

Five-Count Complaint

Andersen's five-count complaint, filed in U.S. District Court in New Hampshire, alleged among other things that the commissioners withheld information about the management team that was to be responsible for assuming DP operations once the SLC's inventory and distribution system was up and running. Salaries for this team were to be cut from the SLC's budget, information Andersen charged was never presented to the company. Andersen said the SLC knew the team's dissolution meant the company could not properly implement the desired system.

As a result of the state's fiscal actions, the system start-up was marked by operational problems that resulted in the state's hiring Newbert to investigate the matter. Newbert completed a report that he released to the governor of New Hampshire and whose contents were later leaked to the press, Andersen charged.

Newbert then went on record claiming that the system recommended by Andersen be scrapped and replaced entirely, while criticizing Andersen for improperly designing and implementing the system.

Green Light

Meanwhile, last month, the state gave the SLC the green light to lease a Sperry Univac 1100/60 mainframe and build a real-time, in-house liquor control system around it. The mainframe will be used to replace the Univac 90/40 purchased in 1979, which Univac will buy back as part of the lease agreement, according to

an SLC spokesman.

For the past 18 months, the SLC has been maintaining its control and inventory programs by using the 90/40 (housed at a remote site) and by leasing time on the State Highway Department's Univac 90/80 mainframe, said David J. Griffiths, DP director and accounting manager at the SLC.

While declining to talk about the suit or about Andersen in any way, Griffiths said his office has chosen not to implement the Tracs software package, marketed by Tempo Computer Services Marketing Co. of Canada and recommended by Andersen, because of an additional \$90,000 it would take to install. The package originally cost the state \$50,000.

Griffiths also said he has no plans to use the package in the future.

With the new system based around

the 1100/60, Griffiths said, the SLC will attempt to eliminate much of the paper crunch that now characterizes the commission's dealings with vendors. He hopes to accomplish this by devising programs to allow direct vendor dial-up to the mainframe in filling orders and submitting billings. Univac will provide his staff with the software utilities to implement these and other system specifications.

"We'll have the kind of system a modern DP shop needs," Griffiths remarked.

For its part, Andersen has severed contractual ties with the state in the matter, ties it refused to maintain once the SLC released its management team, according to a company spokesman. He said Andersen is owed no money by the state.

DPers Sue the Blues, EDSF

(Continued from Page 1)

problems that may have been caused by employees unhappy with the changes."

The spokesman concurred that the DPers were given the choice of working for EDSF or being let go and were guaranteed that the terms of their new employment would be comparable. These conditions, he said, were predicated upon a legal agreement struck between Blue Cross and EDSF during secret negotiations that preceded the EDSF takeover.

Shinkle's Charges

In the eight-page complaint filed in Iowa District Court, Shinkle charged that Blue Cross violated its severance pay policy, which entitles employees to "be granted [pay] in the event that termination is due to a reorganization or a reduction of staff within." The policy was designed to grant salaried employees up to 12 months' wages as severance pay, depending on the number of years they had worked.

Shinkle alleged further that benefits granted employees by EDSF were not comparable to what they had received from Blue Cross. He cited the

Office Systems Expo Slated for March

WASHINGTON, D.C. — The seventh annual Federal Office Systems Expo (Fose) is scheduled March 14-17 at the Washington Convention Center here.

More than 200 companies are scheduled to display office system technology at 700 exhibit booths. An expanded conference — 60 sessions over four days — will address integrated office systems in both government and industry, according to the show's sponsor, National Trade Productions, Inc.

The conference costs \$250 and admission to the exhibition costs \$5. More information about the conference and the exhibition is available from Mary Beth Bouled, National Trade Productions, Inc., 9418 Annapolis Road, Lanham, Md. 20706.

health insurance plan as one example in which EDSF "gave the employees a few extra bucks a month because they [EDSF] couldn't provide a comparable health insurance plan."

In a memorandum distributed to employees the day EDSF took over, Eugene Sibary, Blue Cross president, said no severance pay would be granted the DPers because the company had "made arrangements for immediate employment of all personnel affected."

Shinkle's charges against EDSF are directed at that company's alleged actions against the DPers in the months following the takeover. Shinkle said there were "wholesale firings" of some employees, while others were "told in no uncertain terms that EDSF was not the place for them."

Employees laid off or fired by EDSF were granted severance checks "that were not even close to what they would have gotten from Blue Cross," Shinkle said further.

If and when the case goes to court, Shinkle said he will attempt to show that EDSF engaged in a concerted effort to "use" the DPers to aid in the transition process, then systematically terminated their employment one way or another.

Meanwhile, 38-year-old Dante Vignaroli, who found a job as a systems analyst at a department store here seven months after EDSF laid him off last November, is still steaming over the matter. He said EDSF granted him four weeks' severance pay when he was laid off; he feels Blue Cross owed him 22 weeks' pay.

"I was told I wasn't cut out for EDSF," Vignaroli said of his former employer. "We all could see the handwriting on the wall when they started bringing their own people in."

"I would just like to see other people like myself be aware of what their benefits are, or are supposed to be, because there's a lot of mergers and acquisitions these days," he continued. "Get your benefits in writing. This whole thing, you know, was rotten from the start, and no one really cared about us, certainly not EDSF[F]."

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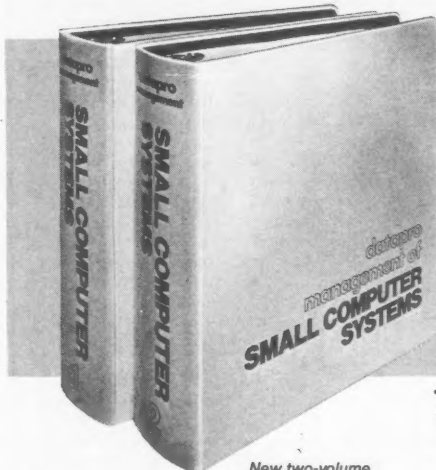
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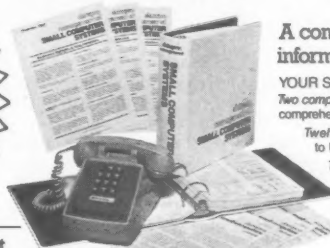
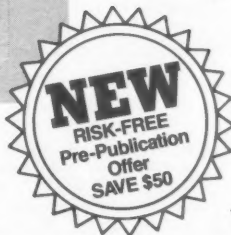
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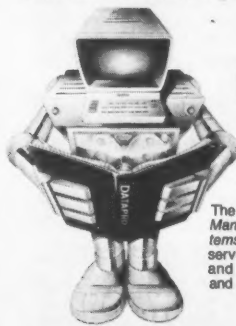
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DPRO-065

White House Announces Plan for Compatibility Of All Federal Computers

By Jake Kirchner

CW Washington Bureau

WASHINGTON, D.C. — The White House has announced an ambitious long-term plan to "fundamentally change" the structure of the federal government, a plan that prominently features governmentwide compatibility of all administrative computer and communications systems.

Vowing to create a government that operates like a private corporation, White House adviser Edwin Meese last Wednesday unveiled what the White House is calling the "Reform '88" project, which includes a new Cabinet Council on Management and Administration and an inter-agency task force on management reform headed by the Office of Management and Budget (OMB).

A primary goal of the plan, Meese said, is to replace "the diverse and separate [agency computer] systems ... with compatible components throughout the federal government" over a period of time. Eventually, he said, the thousands of agency management systems — management information, payroll, personnel, financial, property management, communications and so on — will interface.

Meese decried the government's proliferation of incompatible systems, noting White House figures estimate a minimum of 325 separate financial/accounting systems and 350 different payroll systems in the federal inventory. In addition, he said, federal agencies oversee billions of dollars worth of holdings and disburse hundreds of millions of checks annually, in many cases using only manual systems.

The government should have just one system for each management function, such as payroll and personnel, Meese said, with no more than one "service center" for each agency's use of those systems. This approach, he said, would allow the government to reduce overhead drastically and to cut the number of personnel needed to run federal systems.

Meese, chairman of the new Cabinet council, and Deputy OMB Director Joseph Wright, head of the management task force, conceded they do

not know how long the management reform project will take or how much it will cost and offered only sketchy technical details.

Pressed for dollar estimates at a Wednesday press conference, Wright said he had "no idea" how much it will cost to make the systems compatible. He said developing cost figures will be one of the first orders of business for the task force and added, "I am not willing to wait" for those figures before proceeding.

Six-Year Project

Meese said the project will take at least six years, thus explaining the "Reform '88" designation. "You can't just go out and change all the computers overnight," he said. Instead, the administration will phase in new hardware and software.

"You have a wear-out period when you gradually replace these things ... At that time you buy a new computer ... that is compatible with the overall concept," according to Meese. The Reagan adviser quickly added the White House does not mean to rely on a single computer vendor for compatible systems.

OMB's Wright explained the genesis of the management plan by saying previous Reagan government reform activities found the lack of central, compatible information systems means the government cannot determine what it owns or how much it owes or is owed and cannot adequately control waste, fraud and mismanagement in programs.

There is "a serious, serious need for improved management systems throughout the government," according to Wright, who said the new project is aimed at "fundamentally changing the structure" of the federal government.

Wright insisted the "Reform '88" plan is different from the many government reorganization efforts of previous administrations in that it is directed at concrete action and not at studying federal management problems. The actions will be based on the findings of those previous studies and the recommendations of the current administration's various private- and public-sector management improvement task forces, he said.

Meese Says Plan Envisions Government Running Like Business

By Jake Kirchner

CW Washington Bureau

WASHINGTON, D.C. — "Our vision, and part of the legacy this administration will leave the American people, is a federal government operating in a business-like manner," White House adviser Edwin Meese said recently in discussing the administration's new management reform project.

What is envisioned, the White House explained, is "a federal government management system based on a 'holding company' approach — central policy and coordination, with decentralized responsibility of agency heads for carrying out programs.

"There would be simple, integrated and consolidated management systems characterized by," according to the plan, the application of modern technology, clear accountability and automated auditing, cost-control incentives, "practical performance standards" for personnel and "consolidated units that handle high-volume activities in a compatible, cost-effective manner."

The "Reform '88" blueprint calls for numerous short- and long-term management systems improvements, including a reduction in Office of Management and Budget (OMB) regulations, streamlined procurement policies and regulations and the imminent implementation of an on-line communications system linking the White House and agencies.

A White House fact sheet on the plan said OMB reviewed manage-

ment systems in the private and public sectors and decided four of "the most professional, effective and efficient" were the Dallas city government, Oregon state government, the government of Japan and ITT Corp.

Those four, according to the White House, have common characteristics: clear planning and goal-setting processes; effective budgeting systems tied to planning processes; clear definitions of staff responsibilities; accurate, integrated financial systems; compatible administrative communications and reporting systems; fair, incentive-oriented personnel plans; and effective results analysis and auditing processes.

The federal government, on the other hand, has "spotty" and unorganized plans and goals development; "complicated," people-intensive budget processes; poorly defined staff and line responsibilities; decentralized, incompatible financial systems; manual project-oriented management information systems; and "very structured, complicated" personnel systems.

The "Reform '88" planners also noted that the federal government has 2.5 million employees, 60% of whom are white-collar workers, and 150,000 DP employees operating 16,000 computers at a cost of approximately \$6 billion a year. "And," they said, "we don't really know the total cost of administration, which means simply that we don't know the cost of doing business."

CCI Adds Unix-Compatible, Fault-Tolerant Line of CPUs

By Jake Kirchner

CW Washington Bureau

WASHINGTON, D.C. — Computer Consoles, Inc. (CCI) introduced a family of Unix-compatible, fault-tolerant systems last week based on the Motorola, Inc. 68000 processor and utilizing CCI's Perpetual Processing operating system.

The Power 5/20, shown here at the Federal Computer Conference last week, and the larger Power 5/55 are the first in a line of Power 5 systems that are targeted for transaction-oriented applications. The 14-year-old company is known for supplying AT&T and its affiliated Bell operating companies with such high-transaction systems as the one involving directory assistance.

The 5/20 hardware, ranging in price from \$19,600 to \$37,400, was designed for office environments and can accommodate up to 32 RS-232 or RS-422 I/O ports. The system can be backed by up to 4M bytes of memory and a 35M- or 70M-byte Winchester disk drive, according to the vendor.

The Power 5/20 can be configured using CCI's local-area network and Office Power system for office automation functions, according to Gary Haynes, vice-president of marketing.

As an example of a market for this kind of configuration, Haynes said the company is moving quickly to establish itself in the legal office automation area.

The Power 5/55, with a price range of \$201,700 to \$448,400, is said to feature between 300M and nearly 1.4M bytes of mass storage and up to four front-end communications processors with as many as 96 terminal ports and six disk drive interfaces.

Up to eight processors can be implemented in a Power 5 system, which can include systems ranging from 68000-based MPUs to 32-bit superminis. The systems offer a relational data base environment compatible with Bell Laboratories' Unix operating system, according to the firm.

All the Power 5 systems use the firm's Perpetual Processing operating system and will support Fortran 77, Cobol 74, C and Basic. The systems have common communications interfaces and incorporate Motorola's Versabus bus architecture, the firm said.

The Power 5/20 will be available in January, and the larger Power 5/55 will be available next June. CCI is located at 1212 Pittsford-Victor Road, Pittsford, N.Y. 14534.

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|--|----------------------------|----------------------|----------------------|---------------------|----------------------|----------------------|-----------------------|
| Characteristics | | | | | | | |
| Relative Performance ¹ | 19 | 28 | 33 | 30 | 61 | 120 | 199 |
| Mips ² | .27 | .44 | .64 | .54 | 1 | 2.1 | 4.4 |
| Memory Size in Bytes (Minimum-Maximum) | 524K- 2M | 512K- 5M | 3.1M- 6.2M | 1.5M- 6.3M | 2.3M- 6.2M | 5M | 3M- 6.3M |
| Purchase Price ³ (Memory Size) | \$104,000 (\$12K) | \$161,000 (\$12K) | \$180,000 (\$11M) | \$240,000 (\$3M) | \$440,000 (\$3M) | \$780,000 (\$5M) | \$1,700,000 (\$3M) |
| Lease Price (Lease Term) | \$3,191 (3-Year) | \$4,830 (3-Year) | \$6,703 (3-Year) | \$7,930 (3-Year) | \$12,840 (3-Year) | \$27,086 (3-Year) | \$57,000 (3-Year) |
| Machine Cycle Time (Nsec) | 167 or 250 ⁵ | Not Available | Not Available | Not Available | Not Available | Not Available | Not Available |
| Channels (Minimum-Maximum) | 4-15 ⁴ | 7-32 | 5-20 ⁷ | 5-32 | 6-64 | 8-64 | 28-140 ⁶ |
| Cache (Buffer) Size | 8K | None | None | None | None | None | 18K |
| Bus Architecture ⁷ | No | No | No | No | No | No | No |
| Price per 1M Byte Of Main Memory | \$23,000 | \$15,000 | \$15,000 | \$25,445 | \$31,807 | \$156,000 | \$50,000 |

1. CW estimates based on vendor-supplied information. Relative performance ratings are based on an IBM 370/158-3 equating 45. These numbers are designed to put the processor into perspective with other systems; it is not a buyer's guide. All systems are not alike; they use different operating systems, in-

struction sets and architectures and, therefore, cannot be directly compared. In addition, actual relative performance may vary with the application, peripherals and software.

2. CW estimates.
3. For the processor, console, power supply and all prerequisites.

4. The B2900 uses a data link processor in place of conventional I/O channels.

5. Machine cycle time is 167 nsec when operating at 4 MHz and 259 nsec at 6 MHz.

6. The B7800 uses I/O processors in place of conventional block multiplexing channels.

7. Per each B5920 processor.

CW Chart

Burroughs' Latest Lineup

Burroughs Unveils Mid-Range B5290 CPU

By Tom Henkel

CW Staff

DETROIT — Besides unveiling the first in a new line of upper end mainframes, Burroughs Corp. last week also announced the B5920, an entry-level addition to its mid-range B5900 line of processors.

In addition, the vendor introduced a line of software conversion aids that reportedly help IBM, Sperry Univac and Honeywell, Inc. users migrate to its B5900, B6900 and B7800 processor series.

The B5920 processor reportedly incorporates a revised operating system, offers more efficient usage of microcode and features optimized peripheral and data communications processors. Combined, they boost internal performance by as much as 35% over existing B5930 processors, Burroughs said.

The processor is available with 3.1M to 6.1M bytes of main memory using 64K-bit memory chips. The processor, memory and I/O subsystem require 69% less space than current B5900 series processors, according to Burroughs.

The B5920 is software-compatible with the larger B6000 and B7000 series processors. Furthermore, a sin-

gle-processor B5920 can be field-upgraded to a four-processor system with up to 15.5M bytes of main memory, the vendor said.

A 3.1M-byte B5920 processor costs \$180,000 and leases for \$6,703/mo on a three-year plan.

Conversion Aids

The software conversion aids for IBM, Sperry Univac and Honeywell machines come in two forms: program conversion and data conversion packages.

The program conversion packages are aimed at converting the three vendors' Cobol compilers to Bur-

roughs' specifications. Packages are available to convert Ansi-standard Cobol 74 programs to Burroughs Cobol 74. Another package converts Ansi Cobol 68 code to Burroughs Cobol 74 code, the firm noted.

Data conversion packages are available to help users convert from specific vendor's formats, such as IBM's RPG programming language and IBM's Basic Assembly Language. The conversion packages lease for \$360/mo on a limited-term basis.

The Cobol 68 to Cobol 74 conversion package costs \$145/mo.

Burroughs is headquartered at Burroughs Place, Detroit, Mich. 48232.

Burroughs Starts New Line

(Continued from Page 1)

space than the older B4800 series; cooling requirements have been reduced by about 50%.

Although Burroughs said the B4900 series architecture is software-compatible with existing Burroughs systems, it announced a new Master Control Program, MCP IX, with the B4955.

Like other Burroughs processors, the B4955 is equipped with an I/O

processor (IOP) that initiates data transfers between the memory and peripheral subsystems. The IOPs are connected to the central processor via Data Link Processors, each of which is specially programmed for the I/O subsystem it serves.

In addition, the B4955 can be used with Burroughs' CP 3680 front-end processor to provide data communications capabilities, the spokesman said.

A basic B4955 system with 5M bytes of main memory, console, display terminal, two 5 1/4-in. minidisk drives, two magnetic tape units, one printer and two B4304-90 disk packs costs \$780,000. That configuration costs \$27,086/mo on a three-year lease, Burroughs said.

Burroughs is headquartered at Burroughs Place, Detroit, Mich. 48232.

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Judge Dismisses All Charges Against Three In IBM Case

By Jeffrey Beeler

CW West Coast Bureau

SAN JOSE, Calif. — A federal judge last week dismissed all charges against three of the 21 individuals accused of taking part in an alleged Japanese conspiracy to steal IBM systems technology.

Judge Robert Aguilar's dismissal of charges against Tabassom Ayazi, Raymond Cadet and Barry Saffaie was prompted by the prosecution's continued refusal to surrender government documents that attorneys for the three suspects had described as crucial to their clients' defense.

The documents in question purportedly describe IBM's role in the seven-month FBI "sting" operation that last June led to criminal indictments against Hitachi Ltd., Mitsubishi Electric Corp. and 21 of their employees or alleged agents.

The attorneys representing Ayazi, Cadet and Saffaie had hoped to use the materials to bolster their claim that the government's undercover investigation constituted entrapment, that it was guided by IBM and that the investigation represented an attempt to crush the company's competition.

Aguilar agreed with the defense's argument that Ayazi, Cadet and Saffaie were justified in demanding the government-held documents and ordered that the information be immediately surrendered. But the prosecution defied the court order on the grounds that the defense's discovery motion embraced an unreasonably large volume of material and that many of the requested files are irrelevant to the case.

The government's defiance persisted, even after Aguilar threatened to dismiss the case against the three defendants unless his order was promptly obeyed. The threatened dismissal finally became a reality on Sept. 28 in U.S. District Court here.

Aguilar's action applies only to the criminal charges filed against Ayazi, Cadet and Saffaie, who stood accused of receiving, selling or transporting stolen IBM technical documents that the prosecution had labeled "trade secrets."

Local U.S. Attorney Joseph Russoniello and his colleagues have 30 days to decide whether to appeal Aguilar's dismissal, and a decision on the question is expected to come by the end of this week.

Corrections

"Tract-80 Data Base Maps Census Data" [CW, Sept. 20] gave the incorrect price for Geographic Data Technology, Inc.'s Tract-80. The 1980 census tract boundaries that the firm is offering for use with computer mapping cost \$16,000 for all 323 Standard Metropolitan Statistical Areas (SMSA), not \$175 as was stated. The \$175 figure was for the Atlanta SMSA alone, to demonstrate the cost at 50 cents per tract.

The software firm of Miningham &

Oellerich, Inc. (M&O) was incorrectly identified in "Church Buys Software Before Hardware" [CW, Sept. 27] as sole supplier of software systems to the United Presbyterian Church. While M&O provided the general ledger software, Comprehensive Computer Services, Inc. (CCSI) supplied the accounts payable, accounts receivable, order entry/inventory software. CCSI is located at 2608 Berlin Tnpk., Newington, Conn. 06111.



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Quality of Work Critical To DP Promotion: Survey

(Continued from Page 1)

Mifflin Co. in Burlington, Mass. "Quantity of work doesn't matter if it's bad work."

Second and third on the list of promotional qualities, the survey found, are the ability to work with others and technical knowledge. Thirty-seven percent of the respondents believe communication skills and personality are desirable factors when it is time to move an employee up the ladder.

"The ability to work with others is a prime feature" of promotion criteria, a Cleveland bank's vice-president of information systems said. "We work very closely with our users. If you're going to be promoted — as data processing moves closer to users — it's more important to be able to work with others."

A distant third on a list of eight promotional characteristics was technical knowledge, weighing in at 25%. Some managers interviewed considered technical knowledge and quality of work closely related, if not synonymous.

Self-Confidence Key

"Technical skills, communication ability and the ability to sell yourself are important. You have to display confidence in yourself in order to sell the product," according to Ed Morrissey, director of information services for Uniroyal, Inc. of Middlebury, Conn.

The Ideal DP'er

By Paul Gillin
CW Staff

If the responses of 16 high-level DP executives to an informal *Computerworld* telephone survey are any indication, the ideal DP professional is essentially a good Boy Scout with a knowledge of Cobol.

Asked to describe the model DP employee, the DP executives cited about a dozen qualities. The most common qualities included:

- **Motivation.** Cited by most DP executives as a key to achieving visibility, motivation embodies both enthusiasm and willingness to ask questions. "People have to want something," said Ed Morrissey, director of information services at Uniroyal, Inc. in Middlebury, Conn. "They got that message to me by accepting added challenges and doing a little extra with every job."

- **It's important that they look to keep current with technology, apply the knowledge they have and ask questions when they need information,** said Ron Herberg, director of DP operations at Marriott Corp. in Washington, D.C.

- **Reliability.** "I don't want to have to point everything out and follow up every project," said James Burns, vice-president of corporate data services for Houghton Mifflin Co. in Burlington, Mass. "Ideal employees take upon projects themselves and follow them up themselves."

- **They should have the ability to deliver exactly what is expected of them,** said Eugene Bedell, director of corporate management informa-

All 16 of the interviewed executives indicated that they are in some way grooming successors in the event of their own promotions or career moves. Although a small percentage said that a groomed successor could take over prematurely, most do not feel threatened by a candidate in the wings. "If there's no successor, there's no way to move on," Morrissey said.

But technical knowledge was also rated an important characteristic for a successor by 50% of the other DP executives surveyed. "I have three candidates," said Nell Cox, senior vice-president of the DP center at the City National Bank of Los Angeles. "They're a little out of the technical area. They are people who can communicate well and relate to senior management, but they have to have some technical expertise."

Most of the managers interviewed said that the frequency of promotion varies with the position. Junior programmers can expect a speedy promotion, within one or two years; the more a DP professional rises through the ranks, the more scarce senior positions become.

The DP executives interviewed were almost unanimous in stressing that office politics plays no part in the selection of a promotional candidate. Although the feelings of other employees must be considered, "you have to make your decision and live with it," Cox said.

tion systems for FMC Corp. in Indianapolis. "That's not a very common thing in this business, but we place a high priority on it."

- **Communication skills.** Several managers called communication, both verbal and written, the most important ability for a successful career in data processing. These skills apply equally to co-workers, superiors and customers. "I want somebody whose chemistry fits the organization," said the DP head of an air express firm. "This is more important today than ever before."

- **You want someone who never gets rattled, always wears a smile and emanates confidence,** said Nell Cox, senior vice-president of the DP center at the City National Bank in Los Angeles, "someone who works well with everyone and with whom everyone wants to work."

- **Technical ability.** This does not necessarily mean four years of college, most executives stressed. The ability to apply skills learned on the job is just as important as a college education. Employees who augment their training with outside courses will be more visible.

- **Interpersonal skills/salesmanship.** "As data moves more into the hands of end users, it's vital to be able to work with them," noted the DP director of a large Cleveland bank.

- **That includes assertiveness — knowing when to say 'No,'** said a major appliance manufacturer's DP manager. "If you aren't assertive, your production window shrinks to nothing."

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PDS Updating Creating Problems at MVS Sites

(Continued from Page 1)

might overlay me or overwrite me. If you have daily backup procedures, he can go back to the previous day and get the old version. But if it is something that was added, he wouldn't have an old version."

"Our IMS [IBM's data base management system] test library has been hit," Merv Hemp, a systems programmer with Atlantic Richfield Co. in Los Angeles, explained. He said that if a user has a test IMS system and people are developing their applications for it, they would want to build these applications and put them into a test PDS that would be allocated as Share (available for concurrent use by more than one user) by IMS.

"That data set used to get clobbered," Hemp recalled. "You would see strange things like two members with the same name in the PDS, which is not supposed to be. When that happens, the applications programmer loses the availability of the test IMS system for application development until they can restore from an older version and bring up the test IMS again."

Most people have tried to get around it either by restricting what utilities can be used to update what libraries or by saying that you can only update a particular procedure library or similar data set with a certain class initiator, according to Hemp.

"It really gets to a point where it is very cumbersome," he added.

Modification Tape

A modification tape using this technique is available through MVS users groups (see story above). However, the modifications solve only about 90% of the problem and fix batch utilities only, according to Sue Kemper, a systems programmer with the Music Corp. of America in Universal City, Calif.

Kemper, who is president of the Los Angeles MVS Users Group, added that there apparently is no modification available for IBM TSO users, although one MVS site has developed a way to handle the problem for users of Applied Data Research, Inc.'s Roscoe.

The problem has existed since at least 1980, a number of users noted. When contacted by *Computerworld* about this situation, an IBM spokesman commented, "While we are currently evaluating customer concerns, we continue to state that the only guarantee of data integrity during update processing in either MVS or MVS/XA is via exclusive use." This means that users must employ the disposition Old status which, unlike disposition Share, reserves the use of the partitioned data set while one person is accessing and updating it.

Kemper presented the situation and IBM's response (provided by Arnold Stodolsky who represented the vendor) for discussion at the L.A. MVS Users Group meeting Sept. 16. According to Kemper, the general response from attendees was, "We should get something for our dollars besides headaches." She added, "What if you have 50 programmers all updating a source data set?" The attendees agreed they do not want to

A Partial Way Around the Dilemma

MARINA DEL REY, Calif. — Until IBM provides a solution to the problem of concurrent updates of partitioned data sets under MVS, there is at least a partial way around the dilemma.

This is in the form of a modifications tape that is available through MVS users groups such as the Los

Angeles MVS Users Group, whose president is Sue Kemper. A copy of the modifications tape is available to users who send a blank tape to Howard Dean of GTE Data Services, 4750 Lincoln Blvd., Marina Del Rey, Calif. 90291.

The modification was designed essentially to front-end some IBM

utility programs, such as IEBCopy and IEBUpdate, to issue a reserve for the data set that is being updated.

According to some MVS users contacted by *Computerworld*, this is not the ideal route, but it apparently has saved people from having to restore partitioned data sets.

wait an hour to get to procedure libraries.

Kemper and other users have stressed that this is a data integrity problem that should be dealt with by IBM.

The users are requesting that IBM provide protections in the utilities that will avoid this problem. Hemp indicated that the fix might be better placed in Open itself. "Then have all Opens for update issue some kind of

an enqueue [reserve], all using the same enqueue name." Several of the users have suggested that an additional level of enqueue or reserve be developed to protect the members of a PDS, rather than just the PDS itself.



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After State Runs DP Cross-Checks

Mass. Charges 23 With Illegal Welfare Claims

By Paul Gillin
CW Staff

BOSTON — A Suffolk County grand jury here has returned indictments against 23 people, including 16 public-sector employees, charging them with filing unlawful welfare claims that netted \$287,000 in public assistance.

The indictments were the result of information turned up by a state-run computer program that matches state revenue and welfare records.

Nineteen of the 23 persons were arraigned in Suffolk County Superior Court. All pleaded innocent to the charges. All but one were released on \$1,000 bail and their cases continued

until Oct. 15 for pretrial conferences. The four other defendants are expected to be arraigned shortly.

Although the size of the alleged fraud and the involvement of public employees lent a sensational air to the indictments when they were announced in the Boston press, they represent only a fraction of the cases that have been prosecuted since a 1978 legislative mandate established a computer matching system to catch welfare defrauders.

That legislation requires Massachusetts employers to report wage data on a quarterly basis to the state Department of Revenue. It also requires that the information be cross-

checked with data from the Department of Welfare and Employment Security as well as with account information from Massachusetts banks to determine if any recipients are receiving unlawful payments.

The cross-checks are run on an IBM 3033 computer at the state's Bureau of Systems Operations Division of Administration and Finance, where the software was developed.

According to Harry Shea, assistant commissioner for program monitoring and auditing for the Department of Welfare, the program matches revenue and unemployment compensation records against names of heads of households receiving Aid to Fam-

ilies with Dependent Children, general relief, food stamps or medical assistance. When the records of the three departments indicate a match, the case is investigated by the Welfare Department and, if necessary, referred to the State Bureau of Investigation (SBI).

A separate file is also maintained which holds secondary information on welfare recipients, such as characteristics of dependents, geographic locations, Zip Codes and others, according to SBI General Counsel William G. Ferulla. The file is used to determine if any welfare recipients are double-dipping by using false names or Social Security numbers.

"We might come across a 12-year-old girl with income that shows she works full-time," Ferulla said. "Then in the investigation we find the child's mother uses a wage report filed under the child's Social Security number."

Matches Recipients, Accounts

The system was recently expanded to include a feature that matches welfare recipients' Social Security numbers against accounts in more than 1,000 Massachusetts banks. In its first year of operation, the system exposed hundreds of welfare recipients who may have defrauded the state of as much as \$129 million [CW, Sept. 20].

Ferulla said that in the year before the programs were installed in 1979, about 3,100 cases were referred to his department for investigation. He said that more than 25,000 cases have been referred in the first eight months of 1982. His department currently has a backlog of about 45,000 cases under investigation.

"The system has paid for itself many times over," Ferulla said. "In 1981, 1,700 people were prosecuted in Massachusetts and 660 people found guilty of welfare fraud. Already this year, 834 people have been found guilty."

Ferulla said that about \$13 million in orders of restitution — court orders to pay back unlawfully acquired benefits — will be issued this year. "About 90% of those orders will be a result of the computer matching," he said.

U.S. Rep. Barney Frank (D-Fourth District), who along with state Representatives Andrew Natsios and Nils Nordberg sponsored the 1978 legislation, said he is not surprised by the success of the computer cross-check system. "The overwhelming majority of welfare recipients are fully entitled to those benefits," Frank said. "But even an 8% to 10% fraud rate is a lot of money."

State Attorney General Francis X. Bellotti, whose office is prosecuting the case against the 23 defendants, said the computer check has been a major boost in efforts to streamline the welfare rolls. "With the enactment of legislation in 1978 designed to permit us to use computers to cross-match state employment and welfare records we have been given the tools necessary to catch and prosecute individuals who are unlawfully collecting from the pockets of both the poor and the taxpayers," he said.




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Datacomm Briefs

SBS Hikes CNS-A Tariff; Other Rates To Rise

By Phil Hirsch

CW Washington Bureau

WASHINGTON, D.C. — Generally higher rates became effective last week for CNS-A, a tariff covering the dedicated communication services offered by Satellite Business Systems (SBS). Revised rates for the company's shared services have also been filed, but are not scheduled to become effective until January.

Under the previous CNS-A tariff, a customer paid \$12,150/mo for each earth station, plus a varying amount for each port. Now the earth station charge is \$17,815/mo.

Data port charges remain the same, but voice port charges have been lowered. However, a minimum fee has been imposed in both cases. Its net effect is to increase rates for those who need a small number of ports.

However, SBS softened the blow somewhat by imposing the minimum in five stages. Initially, it will be \$6,650/mo and will rise to \$17,850 by next October.

Transmission charges have also been revised. Previously, the company offered a Full-Time Transmission Unit (FTU) 24 hours a day, seven days a week, and a Demand Transmission Unit (DTU), assignable on request to handle temporary traffic peaks. Under the new tariff, rates for both FTUs and DTUs are increased — from \$2,100/mo to \$2,550 in the former case and from 1.12 to 1.6 cent/sec in the latter.

These increases are mitigated by the introduction of Full Business Day Transmission Units (FBTU), available from 8 a.m. to 8 p.m., Monday through Friday. The FBTU is priced at \$2250/mo.

FCC OKs SBS Request For Overseas Operation

WASHINGTON, D.C. — The Federal Communications Commission has authorized Satellite Business Systems to begin operating overseas. A service agreement has already been signed with the British, and SBS is holding discussions with a number of other European countries, said a company spokesman.

The new service initially will be a nonswitched private line offering. It is said to feature data rates of 2,400- to 56K bit/sec and can be increased to 1.5M bit/sec.

Computer-to-computer data transfer, electronic mail/message service, alternate voice/data transmission and video teleconferencing will be the chief applications, the spokesman said, adding that freeze-frame as well as analog full-motion video is available.

AT&T Will File With FCC For BPSS in November

WASHINGTON, D.C. — AT&T will file a Section 214 application with the Federal Communications Commission (FCC) for its proposed Bell Packet Switching Service (BPSS) in November, avoiding a continued battle over whether the filing is nec-

essary.

The phone company has also agreed to offer BPSS on a shared rather than a dedicated basis.

The FCC rejected the initial BPSS tariff in July because no Section 214 application had been submitted. The commission also said Bell should "buttress its claims that BPSS ... is not an offering primarily tailored for its separate subsidiary."

Prospective competitors had argued that by requiring each BPSS switch to be leased on a dedicated basis and by allegedly charging exorbitant rates, the phone company was intentionally restricting BPSS to American Bell, Inc.

AT&T's Bell Trademark Subject of Lawyer's Battle

WASHINGTON, D.C. — Whether AT&T should remain "Ma Bell" after divestiture became the subject of a three-corner lawyer's battle here late last month. The dramatis personae:

- Tandy Corp., which makes telephone sets and answering devices besides personal computers.
- The Department of Justice.
- AT&T.

It started several weeks ago when Tandy complained to Assistant Attorney General William Baxter, head of the Justice Department's Antitrust Division. The department will soon be presented with a reorganization plan prepared by AT&T to carry out the agreement settling the government's antitrust case against the phone company.

Tandy wanted the Justice Department to require "explicit provisions" in this agreement prohibiting AT&T from making any use of the "Bell name, the Bell symbol, related trade names, trademarks and marketing symbols."

AT&T Vice-President and General Counsel Howard Trienens responded soon afterward that "AT&T has already started to advertise a new name — American Bell — with a new logo, for association with services other than those which will be divested."

Tandy was not mollified, however. "The AT&T response," said Tandy counsel Malcolm R. Pfunder, "removes all doubt as to its future intention ... Unless the [Antitrust] Division or the courts stop them ... it will be a divestiture in law, not in fact. Through massive advertising, AT&T will in effect tell customers that the Bell system remains one ... Competition, the whole purpose of the [settlement agreement], will be the victim."

Last week, however, Pfunder said in an interview that Tandy is willing to accept a compromise devised by Baxter under which AT&T, after divestiture, will be able to use "Bell" as part of a corporate identification — for example, "American Bell, Inc.," "Bell Laboratories" — but not in association with any specific product.

As a result, a new name will have to be found for the Bell Packet Switching Service and several other offerings.

In addition, "Ma Bell," long a favorite of journalists, editorial cartoonists, comedians and other public image makers, will have to be buried.

Customer Needs Said First Priority

Do Vendors' DP Departments Get Short Shrift?

By Jim Bartimo
CW Staff

Ever wonder what kind of toothpaste the people who work for Crest use?

Ever wonder if the people who work for General Motors drive the latest model Chevy?

And ever wonder whether the DPs who work for computer vendors use the latest in computer technology?

According to employees of three different computer vendors' data processing departments, a close association with computer technology does not always guarantee that their shops are any better off than their counterparts in other companies that manufacture toothpaste or automobiles.

Digital Equipment Corp.'s data pro-

'Digital Equipment Corp.'s data processing department... has the lowest shipping priority when it needs a new piece of equipment. "We satisfy the customer first."'

cessing department, for instance, has the lowest shipping priority when it needs a new piece of equipment. "We satisfy the customer first," said one DEC programmer/analyst. "We're overhead, and they pay for it. 'If we need a new piece of equipment, it goes to the customer first. We usually get the software a couple of weeks early,'" he said.

"The data processing departments of vendors have been the cobbler's children for a long time, but that's

not true here," according to Bill Stella, director of information resources at Prime Computer, Inc. in Natick, Mass. "We have a role in product testing. We're a model for our own products. We give a lot of product demos."

Just Another Customer

Hewlett-Packard Co.'s San Diego Division sees itself as "just another customer" of HP. "We try to stay relatively neutral," said Doug Amsbary, information systems manager. "We're not obligated to buy every new product that comes along, but we don't hold back either. We always have the right to say 'yes' or 'no.'"

"One advantage is that we don't have to pay as much for equipment," Amsbary admitted. "Another advantage is that we can apply to test prod-

ucts before they are released.

"We stick mainly with our own equipment," Amsbary said, "but it's not a mandate. Some divisions have equipment from vendors other than HP."

Using homegrown equipment at minicomputer manufacturer Prime has led to the unusual situation of a \$400 million company that has no mainframes in its DP department. "We have 33 Prime 750s and 850s," Stella said.

Are end users any different in a computer company?

"I was with Gillette [Co.] for a while," Stella said. "There is more acceptance toward the current technology here. There's not as much user resistance. There is a tendency to promote user technology, but I don't have to sell that much here."

"I suppose that's because this is a young company that grew up on technology," he said. "I was with Honeywell, [Inc.] for a while, and that wasn't true there."

One programmer/analyst at DEC said that his department is no different than any other DP department in a manufacturing firm. "We provide a service for our company," he said. "We do order processing just like other companies do."

And like other companies, he said, problems, such as deadlines, maintenance and pressure for more productivity, are just as prevalent.

To Advise Reagan on Security

Telecommunications Committee Formed

WASHINGTON, D.C. — A National Security Telecommunications Advisory Committee was created by President Reagan earlier this month to advise the President regarding "specific means to improve the telecommunications aspects of our national security posture."

Composed mainly of chief executives from communications carriers

and companies that supply on-line systems/services, the committee officially results from an executive order issued by then-President Jimmy Carter in 1979. But the recent settlement of the AT&T antitrust case was another factor in the committee's creation.

Breakup of the Bell system means that the Department of Defense

(DOD), which traditionally has relied almost exclusively on AT&T for communications support and for coordinating requirements involving other carriers, must now take on much of the coordinating chore itself. The new committee, whose members presumably will represent all sectors of the industry, is designed to make DOD's task easier.

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DP Shops Defining Software Needs Poorly, Exec Says

By Robert Batt

CW West Coast Bureau

MIRADA, Calif. — Many data processing shops are doing a poor job of defining their software requirements and are causing themselves endless problems as a result, a senior MIS executive claimed.

Richard Kislowksi, management information system (MIS) director at Denny's Inc., a major food retailer, argued that definition requirements are an anathema to most program analysts because they are reluctant to get involved in the nitty-gritty details of drawing up a requirements document.

"Without establishing requirements definitions, users often end up changing significant amounts of programming code which they then have to maintain, and so if something goes wrong they are up the creek," he said.

According to Kislowksi's deputy,

Evan Wride, many companies, both large and small, make this mistake because they are unwilling to spend the time to clarify first what kind of software they are looking for and what they need to build.

"If you do not spend the time to do this, as a user you will never be satisfied and it doesn't matter whether you buy packages or write your own software in-house," Wride added. He admitted that drawing up a requirements definition document is not perceived by analysts as fun. Instead, they view it as hard work with no immediate tangible benefits.

However, both of Denny's executives claimed that a rigorous approach to definitions requirements results in substantial benefits. Kislowksi cited a recent case in which the company discovered that there were only two software packages on the market that came close to satisfying their requirement for a weekly

financial operating statement.

"Most companies operate with monthly financial results and so there is little suitable for us on the market. However, we would not have discovered this unless we had taken the time to research the market," Kislowksi added.

Such an approach, he said, also leads to costs savings because it ensures that the most commercially sound and technically feasible system is installed initially.

"You need to motivate your analysts and change their perception of success. If you can get them to see that definitions requirements means that the systems will be up and running smoothly in a shorter period of time than it would otherwise take, they are more inclined to go along with it," Kislowksi said.

This approach, said Kislowksi, could be successfully applied to both systems and application software and, in the process, the analysts' perceptions of what is required for successful implementation are altered.

Too many DP shops cling to the attitude that software not invented in-house is not good, Kislowksi maintained. "The not-invented-here mentality is still rife," he said. "Our approach is to do a detailed market survey and, if possible, find software that is a close match to our requirements and to iron out remaining variances with the user."

"The approach is to get the user involved at an early stage," he noted.

Consequently, MIS personnel at Denny's consult present-day users of a particular system to get their reactions to any software package. They also conduct telephone interviews with other users. It therefore takes at least six months to choose a specific package.

"We provide our users with the information we have gathered and they make the final choice so that the system becomes a user system — not something that MIS has foisted upon them." This, Kislowksi claimed, makes the user take responsibility for the package. "During the implementation phase, the users know they have to make it work and so they assign whatever resources are needed toward that end," Wride added.

Denny's reportedly looks for a 90% to 95% match between its requirements and the performance of any software package. Its philosophy, Kislowksi said, is to find a package that will not require any radical changes to the mainline code. This approach, he claimed, is appreciated by large software vendors, but smaller software houses become frustrated by a detailed approach and often lose potential orders as a result.

"Since our own business is changing rapidly, we look upon this as a learning experience and if a vendor can demonstrate to us that changing our requirements is an appropriate thing to do, we are willing to listen," Wride concluded.

Data Base Course Offered

FREMONT, Calif. — Data Dialogues, Inc. has announced a 10-segment videotape course on data base design.

Called Effective Data Base Design, the course is based around W.H. Inmon's book of the same name.

The course reportedly addresses system and data base design practices for large and complex on-line systems.

Examples are based on IBM's IMS data base management system, but concepts discussed can be applied to other large IBM systems as well, the vendor said.

The set of 10 tapes costs \$4,500. The tapes cost \$500 each, while a set of 10 leases costs \$2,250 (\$250 a tape), according to the vendor.

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Laying Careful DP Plans

Food Service Firms Bucking Recession With MIS

By Robert Batt

CW West Coast Bureau

LOS ANGELES — Members of the food services industry like Denny's, Inc., Saga Corp. and Sambo's Restaurants, Inc., attempting to woo recession-beset customers with breakfast specials, specialty sandwiches, children's games and other gimmicks, are laying careful data processing plans.

For instance, Denny's has recently instituted its first five-year management information systems (MIS) plan. The plan states that "strategies have been developed to improve the use of technology and systems resources in support of the business objectives."

As a result, senior executives will understand the MIS-related opportunities, constraints and expenses within which business goals are to be implemented.

Denny's plan includes an assessment of application areas such as financial, employee, distribution and inventory systems. It also looks at the future of office automation within the corporation, exploring the types of hardware, system software and

communications equipment that will be needed.

With 900 restaurants in 48 states and with revenues expected to top the \$1 billion mark this year, Denny's considers an MIS plan as primary to the existence of the company.

"The business is becoming much more competitive, and every manufacturer is trying to expand its line of business. Our ability to respond to these developments is critical to our success and survival, so an MIS plan helps us to monitor our management approach," explained Richard Kisowski, MIS director.

Point-of-Sale Devices

Denny's, which currently uses its DP technology to plan operations on a weekly basis, wants to use point-of-sale devices to poll information on a daily basis.

"Through more timely information of what is selling and what is not, we can have more effective management at the local level and have better control of our inventory," Kisowski said.

According to executives at Saga Corp. in Palo Alto, Calif., the central issue is how to make widely dispersed units more effective. Saga, with sales last year of \$900 million, runs a contract-feeding group and a fast-food group, including Straw Hat Pizza and Black Angus Steak House.

Len Hanlock, vice-president of information services, said he senses "from my contacts with other food service groups that MIS planning is being taken seriously in more and more organizations. There is a need to have intelligent systems both centrally and at the respective units for both bookkeeping and management control functions."

Like Denny's, Saga — which uses a National Advanced Systems, Inc. 5000 mainframe — has a five-year

strategic plan for MIS.

Sambo's recently underwent a major management upheaval that included bringing in new MIS personnel.

An MIS steering committee has since been set up to coordinate activities between data processing and user departments such as finance and operations.

The company is trying out some new marketing concepts and, according to Randy Watkins, DP vice-president, MIS will play a central part in supporting these activities.

Office Automation

One of the functions of the MIS steering committee is to formulate a plan for new technology directions such as office automation. Since user departments will have the major say in determining this strategy, education classes for DP users will be set up in-house within the next few months to enable them to fully understand such developments.

One of the advantages of an MIS plan is that it can reveal trends within the corporation's DP practices that are counterproductive.

Denny's, for example, frankly admits that for the past several years management has invested capital primarily in the production side of MIS to the almost total exclusion of new development.

This has meant that, until recently, office automation has been largely ignored. The result has been poor productivity. Planning, said the company, has not been a priority, and MIS is constantly "playing catch-up" and "fighting fires."

Thus, the MIS planning document adds, "MIS is not positioned well to take advantage of current and future technology ... MIS must now, through comprehensive planning and management commitment, evaluate our current posture, develop an aggressive strategy and acquire the resources to implement that strategy in an accelerated manner."

Information Conference Set For Dec. 13 in Ann Arbor

ANN ARBOR, Mich. — The Third International Conference on information Systems will be held here Dec. 13-15 on the University of Michigan campus.

Sponsored by the Society for Management Information Systems and The Institute of Management Sciences in cooperation with the Association for Computing Machinery, the conference will present 27 papers selected from 107 submissions from academic and industry authors, a conference spokeswoman said.

Subjects to be covered at the three-day conference include: information systems technology and design, in-

formation system implementation and use, managing the information processing function, impacts of information systems on organizations and society and innovative information systems curricula. Burroughs Corp. Chairman and Chief Executive Officer W. Michael Blumenthal will give the keynote address, the spokeswoman said.

The conference costs \$125 for academics and \$250 for nonacademics. More information is available from Carol Dunn, Graduate School of Business Administration, University of Michigan, Ann Arbor, Mich. 48109.

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FBI Would Expand Files Missing Children Act Nears Passage in Congress

By Jake Kirchner

CW Washington Bureau

WASHINGTON, D.C. — Legislation to create a national computerized clearinghouse of information on missing children at the Federal Bureau of Investigation neared completion last week.

As Congress headed toward adjournment for the fall elections, the Senate and House of Representatives tried to iron out differences in their

versions of the Missing Children Act, which had been approved by the two bodies late last month. Both bills would direct the FBI to expand its current missing persons file, which is part of the National Crime Information Center (NCIC) computer system.

The legislation also would create a national data bank on unidentified dead persons.

Supporters of the legislation say a public commitment to and funds for the upgraded missing persons file are necessary because only 10% of all missing persons are ever the subject of NCIC records and only a portion of those are juveniles. The emotional subject of missing children received considerable attention in Congress last year, and government figures estimate there are as many as 1.8 million children missing from their homes each year.

The bills' sponsors expect that the NCIC will increase the number and types of physical descriptors for the file, while at the same time developing methods to limit the number of hits a file search might produce so that law enforcement authorities will not be inundated with multiple possible leads in individual cases. Those law enforcement agencies now complain that the NCIC system is not useful if the information requester

does not know the name and age of a child — data often not available when trying to identify a juvenile.

Noting the difficulty of creating a file to find and identify persons who generally do not have drivers' licenses, Social Security numbers or fingerprint records, the bills leave the FBI responsible for increasing the utility of its system. The House Judiciary subcommittee that handled the legislation said, for example, it will allow the FBI "sufficient management flexibility and latitude to implement [the bill's] intent."

The subcommittee also promised to monitor the file's development to ensure that the FBI complies with congressional intent without exceeding its jurisdiction.

Differences of Opinion Remain

Although the aim of the legislation has overwhelming support on both sides of Capitol Hill, there remained last week differences of opinion concerning how the FBI should handle the mandated expansion of its NCIC activities.

During the debate on the legislation, it was pointed out that finding missing persons is a local and state responsibility. In the proposed legislation, the NCIC would merely serve as a central clearinghouse for information on missing children.

There also arose a question of whether parents should have direct

access to the NCIC file to input or retrieve its data or be required to go through local law enforcement agencies. The question was one of the central issues remaining to be resolved before the legislation could be cleared for the President's signature.

Besides the jurisdictional questions, several privacy concerns were raised during consideration of the bills, including a fear that being the subject of a missing persons record in FBI data banks could eventually harm individuals who are the subject of parental searches. Some critics of the legislation argue that missing persons, who in most cases have never been committed nor been the victim of any crime, should not be the subject of detailed dossiers in the NCIC, which is primarily a criminal justice system.

In addition, the FBI showed concern during hearings on the measure that the Bureau might be liable for faulty information supplied by parents and asked to be allowed to purge the files when deemed appropriate.

Despite these problems, the two versions of the bill were easily approved by the House and Senate and the legislation was headed for final passage in a single, mutually acceptable version, assuming time allowed. At press time a compromise was still being sought.

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A 500-word abstract or, preferably, a complete draft of the paper should be submitted by Nov. 12 to Dr. A. Jack Schiewe, Co-Program Chairman 1983 SCSC, The Aerospace Corp., Mail Station M1-025, P.O. Box 92957, Los Angeles, Calif. 90009.

THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS' (IEEE) INTERNATIONAL SYMPOSIUM ON INFORMATION THEORY '83, St. Jovite, Quebec, Sept. 25-29.

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Both long (40-minute presentation) and short (20-minute presentation) papers will be accepted. Long papers are due Feb. 1. Short papers will be reviewed on the basis of a 500-word summary and are due March 1. Three copies of all submissions and a brief abstract suitable for the symposium record should be included.

Authors should indicate the area of their paper and send it to Prof. Lorne Campbell, Department of Mathematics and Statistics, Queen's University, Kingston, Ont. K7L 3N6, Canada.

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'Bell Record' Plans for Digital Capabilities

By Phil Hirsch

CW Washington Bureau
WASHINGTON, D.C. — "We intend to extend more and more digital capabilities even closer to the customer," Bell Labs Executive Vice-President John S. Mayo says in the September '82 issue of the *Bell Laboratories Record*, which is devoted to describing how the company plans to accomplish that goal.

In 1981, voice communications earned \$55 billion for the Bell system, while data communications accounted for \$4.5 billion, according to the *Record*. "While these figures highlight the current dominance of voice transmission... the data communications market is expected to grow [20% to 30%] a year during the next decade. To respond to these demands, not only are new ways to provide [local] loops being deployed, but also ways to increase the capabilities of the vast existing local-loop network."

The Local-Area Data Transport System (LADTS) and Circuit-Switched Digital Capability address the latter problem. Both convert the familiar analog local loop into a digital message path.

LADTS will provide frequency filters at both ends of a leased subscriber access circuit, enabling the subscriber to transmit data at speeds up to 8K bit/sec in a frequency band above the one used for voice. Thus, the loop can carry data and voice simultaneously.

Circuit Switched Digital Capability will utilize black boxes called Network Circuit Terminating Equipment at either end of the loop to transmit data at 56K bit/sec alternately with voice.

Both of these new capabilities are "expected" to become commercially available in 1984, according to the *Record*. The first public demonstration will take place next summer in Miami as part of a videotex trial that AT&T is cosponsoring with Knight-Ridder Newspapers.

"The vast majority of data services needed by businesses... can be handled by... Local-Area Data Transport and Circuit Switched Digital Capability," says the *Record*, but there are two exceptions: video and bulk computer-to-computer file transfer, which have to be transmitted at speeds of megabits per second rather than kilobits per second. Bell intends to attack this problem

by using optical fiber and Subscriber Loop Carrier (SLC) systems.

The latter are already widely deployed throughout the Bell system network. An SLC system is a "smart" local loop. At an intermediate point between the telephone network central office and a group of subscribers, an SLC "remote terminal" multiplexes and digitizes up to 96 analog voice circuits con-

nected to residential and/or business customers.

On its other side, the SLC remote terminal is connected to the central office via 1.5M bit/sec full-duplex T-1 carriers, each of which transports up to 48 time-division multiplexed voice conversations.

Within the next year, the *Record* indicates, many of these T-1 carriers will be replaced with optical fiber. "A single pair of glass fibers,"

the publication points out, "can carry nearly 700 conversations a distance of 10 miles without repeaters — a feat that now requires nearly 60 copper wire pairs and 300 repeaters."

Last year Bell Labs began testing the new "Fiber SLC" system at its Chester, N.J., laboratory. "The first commercial application will be in Chester Heights, Pa. later this year"

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Little Interest Greet's Ware's Call to Study Electronic Mail, Linkage Security Problems

By Paul Gillin
CW Staff

LOS ANGELES — Despite his call last May for a national commission to study the potential security problems of electronic mail and business linkages, only a few computer professionals have expressed interest in the idea, according to Dr. Willis Ware.

In a recent interview here, Ware, a member of the corporate research staff at the Rand Corp. and an authority on computer crime, said that the profusion of electronic mail and business-to-business communications linkages likely to occur in coming years could menace individual privacy. "People and businesses are

rushing into electronic mail helter-skelter without concern about the interception and reading of that mail," he said.

At a National Computer Conference panel last June, Ware called for the creation of a national commission to study the problem. However, no one has taken him up on the idea, he said, and the campaign for high-speed paperless communications has forged ahead with little concern for the privacy of the citizens whose personal information is involved.

As an example, Ware cited the U.S. Postal Service's Electronic Computer-Originated Mail service, introduced early this year, which trans-

mits mail electronically between post office computers. The contents of that mail are protected by statute while in the post office, he said, but once the mail goes out over telecommunications lines, security statutes are uncertain.

"Technically, once it [the message] is in the hands of common carriers, it is covered by the Communications Act of 1934, which is completely different from postal statutes," he said. The act permits monitoring of transmissions by a wide range of government agencies for no specific reason. The potential for unauthorized monitoring is also great, Ware said.

The future intrusion of private



Willis Ware

companies and satellite communications into the electronic mail field presents an even stickier problem, the analyst noted. "How are we going to regulate them?" he asked.

No Need for Wiretaps

"Telecommunications eliminates even the need to use a wiretap. A person can literally buy a satellite dish and then monitor the transmissions in his own home," he said.

Computer "linkages" that connect businesses to businesses are not yet widespread or sophisticated enough to present significant problems, Ware said. "Right now, the presence of human beings at both ends of the communication line presents a built-in security safeguard," he said. "But if you move to a more intensive interface, in which everything is handled by a computer, you may create a danger. I think few people have thought about the vulnerability of these automated systems, and the few who have are in the computer industry, not in the business community."

Ware said he is less concerned about the security of electronic funds transfer systems used by financial institutions, "because they are already concerned about security to a certain extent." He noted that the breadth and diversity of financial operations in the U.S. diffuses the possibility of a major financial disaster being precipitated by computer sabotage.

Informatics to Offer Course on Software

WOODLAND HILLS, Calif. — A course that teaches basic through advanced reporting concepts of Informatics General Corp.'s Answer/2 and Mark IV software for IBM mainframes and plug-compatibles has been announced by Informatics.

The course, for programmers and end users, combines lecture and workshops so that students get a chance to apply their knowledge in a hands-on environment. Concepts covered will include standard reporting and output files, table searches, file matching and record selection. Also on the agenda are sessions on reporting facilities, graphics and text processing.

This course will be conducted in regional Informatics training centers throughout the U.S. It costs \$375 for the first student from a company and \$335 for additional enrollees.

Further details can be obtained from Informatics at 21031 Ventura Blvd., Woodland Hills, Calif. 91364.

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Computer Crime Legislation Resurfaces Briefly

By Jake Kirchner

CW Washington Bureau

WASHINGTON, D.C. — Long-pending federal computer crime legislation resurfaced briefly in Congress late last month only to disappear quickly again amid requests for further study of the matter.

First introduced in 1977, the most recent incarnation of the bill, the Federal Computer Systems Protection Act, received cautious Justice Department support at a Sept. 23 House Judiciary subcommittee hearing. But private-sector witnesses said that not enough is known about the computer-related crime problem to warrant the bill's enactment at this time.

The legislation, whose current sponsor is Rep. Bill Nelson (D-Fla.), has been before this Congress since last year [CW, June 29, 1981]. It would make it a federal offense to misuse or use for fraudulent or other illegal purposes any computer owned or operated by the federal government, certain financial institutions and organizations engaging in interstate commerce.

Roger M. Olsen, deputy assistant attorney general, testified that "the potential magnitude of the harm that could be done by misuse of a computer suggests that there is merit in legislation that would directly address computer crime."

Olsen added, however, that "statistics detailing the extent of computer crime are simply not available, and consequently I cannot, in all candor, represent that legislation in this area is clearly needed."

Federal Bureau of Investigation officials told the subcommittee a federal statute would assist in prosecuting computer-related offenses. Assistant FBI Director William A. Bayse, head of the bureau's Technical Services Division, suggested a need for "a federal statute which goes to the heart of the issue of computer-related crime and cuts away unnecessary, costly legal problems associated with application of current laws."

Private-sector witnesses, however, urged the subcommittee to study the matter further before pushing the computer crime bill. Milton R. Wessel, a well-known computer-law expert who has been general counsel to the Association of Data Processing

Service Organizations for nearly 17 years — said, "I do not consider that the need for major governmental action has yet been demonstrated."

Adding, "I do not suggest that there is no computer crime problem or that we should sit on our hands and wait for a crisis to develop," Wessel said that the problem has not been adequately defined.

Wessel also said his opposition to the Nelson bill is philosophical as well as practical.

"We ought not to have legislation unless we need it; it's a matter of freedom," Wessel said. "In a free society, we have to live with a certain amount of crime," he added.

For the present at least, computer crime problems are essentially busi-

ness management problems, according to Wessel, who said there is a feeling "almost universally within the [DPI] industry" that the current computer crime problem can be handled by better management, better security controls and increased awareness of the potential for computer-related losses.

Similarly, computer security notables Donn Parker, SRI International, Inc. and Susan Nycum, of Palo Alto, Calif. law offices of Gaston, Snow and Ely Bartlett, gave only qualified support for "careful legislative action to advance federal criminal laws to deter and prosecute crime in the information age."

But before enactment of such legislation, their joint statement to the

subcommittee said, "All the implications and effects of information age crime and proposed legislation should be identified and thoroughly reviewed in public by a national commission of inquiry to assure adequate attention from and support of the stakeholders."

Rep. Don Edwards (D-Calif.), chairman of the Civil and Constitutional Rights Subcommittee, noted there is not enough time left in this Congress for any substantive action on the bill and welcomed Wessel's suggestion that the congressional Office of Technology Assessment be directed to study the issue. According to Nelson, two additional studies, including one by the Library of Congress, have been requested.

Goldwater to Keynote TSI User Conference

PHOENIX — Sen. Barry M. Goldwater (R-Ariz.) will deliver the keynote address at The Information Exchange, the annual TSI International user group meeting slated to take place here Nov. 1-3.

This year's conference theme is "Productivity Through Software," and user forums will be held, enabling end users to air their views and exchange their experiences with TSI data entry, information retrieval/analysis, document storage/retrieval and data management software.

Registration for the meeting is \$295 for the first person from a company and \$270 for subsequent attendees. Further details are available from TSI at 50 Washington St., Norwalk, Conn. 06854.

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CW 1004

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Report: Business Graphics Market Set to Erupt

By Bill Laberis
CW Staff

DELRAN, N.J. — Tumbling hardware costs, software designed increasingly for non-DPers and management-quality output are all helping incubate a business graphics market set to explode throughout the current decade.

This projected growth is being fueled further by groups like the National Computer Graphics Association (NCGA), whose conferences and newsletters seek to educate the modern manager who is rich in data, although information-poor, about business graphics solutions.

These are some of the findings published here in a recently released report from Datapro Research Corp.

entitled "All About Business Graphics."

Key to the Future

The key to the future of business graphics is the development of general-purpose, device-independent software that can be integrated with data base management systems (DBMS) and statistical reporting software, the report maintains. Such an interface will allow users to extract data from the data base and create graphics from that data. Integrated Software Systems Corp.'s (Issco) Tell-A-Graf and Computer Picture Corp.'s Trend Spotter have both been linked to other vendors' DBMS.

With these and other software developments, business graphics could

represent a major component of automated office systems, Datapro concludes.

The results of a Datapro survey of 50 system users indicated that business graphics systems have gained favor among users. Of those surveyed, 43 said their systems had met initial expectations, and 38 said they would recommend their systems to other users.

In addition, the users of either stand-alone or host-dependent systems (to which graphics display terminals or output devices have been added) were more satisfied than those graphics users reliant on a time-sharing service, the survey showed. However, the experiences of only seven users of time-sharing services were included in the survey.

The report cautions that planning is the key to installing a successful business graphics system, one that will meet present needs while providing the flexibility to accommodate the needs of future growth. To determine a company's needs before taking what could be a costly business graphics plunge, Datapro recommends that a business do the following:

- Structure an evaluation committee to survey available system alternatives, while talking to other firms that already have a business graphics system. This committee should also perform a graphics cost-benefit analysis, identifying potential users and high-payoff application areas. The

committee should be comprised of representatives from both the user and DP departments.

- Arrange for on-site hardware and software demonstrations, and include top management in the audience.

- Draft an implementation plan that lists the equipment already in-house, as well as any additional equipment and software that needs to be purchased for the applications desired.

- Ensure the hardware and software selected is fully capable of meeting user needs.

- After the system is up and running, provide training and technical assistance for end users. This training should include chart design methods as well as use of both hardware and software.

One way around this in-house planning procedure is simply to pay for a reputable business graphics consultant to analyze system needs, the report states.

The report, which lists the characteristics of 30 graphics systems from 24 vendors in a comparison chart, predicts a 40% to 60% annual growth throughout the '80s in the market for business graphics applications. During this time, Datapro anticipates an 80% annual growth in sales of stand-alone business graphics systems.

"All About Business Graphics" is available for \$19 from Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Computer Graphics Meet Slated For Dec. 6-8 in Washington, D.C.

WASHINGTON, D.C. — "Delivering the Promised Productivity" will be the theme of the second annual Conference on Computer Graphics, scheduled to be held in December at the International Hotel here.

The conference, which will take place on Dec. 6-8, will focus on how to design and implement computer graphics systems, both as stand-alone workstations and as part of a graphics network. Critical issues addressed will be how to deliver new capabilities and increase productivity, a

spokesman said.

Two days of the conference will also be targeted to business and scientific presentation graphics, computer-aided design and manufacturing, animation, graphics arts and printing/publishing systems.

The registration fee for the three-day conference is \$695. Further information can be obtained from the conference manager, U.S. Professional Development Institute, 12611 Davan Drive, Silver Spring, Md. 20904.



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Boon or Boondoggle? Business Graphics Buyers Warned of Pitfalls

By Bill Laberis
CW Staff

MOUNTAIN VIEW, Calif. — Is the business graphics road paved with gold and rhinestones? Or is it strewn with potholes that resemble business solutions when viewed from the high-speed lane?

To a company beset by in-house abuse of long-distance telephone privileges, a graphics system could prove a godsend. But unanticipated pitfalls may loom for another company seeking to use a business graphics system for more dynamic, interactive graphical presentations for business meetings.

Thus, according to a study done by Input, Inc. here, users should learn to look beyond the glitter and flash of business graphics and determine just what solutions, if any, a graphics system can offer before spending \$20,000 and up for a new system.

The study, "Business Graphics: Boon or Boondoggle?", concludes that business graphics will bring few short-term but significant long-term advantages to users, a finding contrary to the hype of some business graphics enthusiasts. However, the study also concludes that business graphics will ultimately prove more a boon than boondoggle as hardware prices plummet and software developments provide truly cost-effective business solutions.

Thomas O'Flaherty, principal con-

sultant for Input and author of the study, analyzed user experiences with business graphics systems in preparing the 50-page report. He said his most significant findings were in the area of presentation graphics and its "purported advantages."

In essence, presentation graphics is a well-honed, two-edged sword, O'Flaherty said. On one hand, it can yield for the presenter and his audience a richly detailed, complete set of graphs and charts that can be arbitrarily altered to comply with various "what-if" conditions, especially in an interactive setting, the consultant said.

On the other hand, a meeting held in an interactive graphics environment can get entirely out of control when too many variables are allowed to be presented on the charts, O'Flaherty noted.

"What may have seemed like a really neat idea in the planning stages can turn into something considerably less when actually put into practice," O'Flaherty said. "Put in the control of the wrong hands, a business graphics system can be a costly mistake."

Conversely, a business graphics system designed and built to address specific problems can become an integral and cost-saving feature, O'Flaherty continued. For example, in detecting abuse of long-distance

dialing privileges, a graphics system hooked into a phone-billing data base "can make it very easy to see where the leaks in the system are ... making it all the easier to take corrective steps."

In any case, there is no graphics system that will yield good results when instructed to generate a poorly conceived chart, as "nothing will replace the human element that went into chart design in the first place," O'Flaherty said.

Growth Estimates

In addressing published estimates that project a 50%-plus growth in the market for business graphics systems, O'Flaherty said analysts and users should view such figures of prodigious growth with great caution.

For one thing, they are based upon growth will look impressive statistically at present, "so that any growth will look impressive, statistically." And much of this projected growth in the graphics market will result from a proliferation of microcomputer-based graphics systems, "and you have to ask if this is really business graphics, at least in the sense analysts like to think of it," O'Flaherty said.

"There's no doubt hardware will continue to fall in price while quality of output increases, but I doubt software developments will be out in the

market quite as fast," O'Flaherty speculated. "This means few short-term solutions with business graphics, but great potential for long-term benefits."

For users contemplating a business graphics plunge, O'Flaherty suggested users follow a detailed planning process preceding any capital outlays. While maintaining that most graphics system vendors will not intentionally oversell a product, he suggested many users can and do make incorrect assumptions about what a system can do.

In general, a user in need of only a limited number of high-quality charts and graphs — say 50 or fewer per month — would do well to stick to composing graphs manually, O'Flaherty said. The costs of manual generation vs. using a computer-based graphics system are roughly the same today, a situation that will change as printers, plotters and mainframes decline in cost, he claimed.

Users in need of a greater number of charts but not necessarily of high quality should investigate the growing number of microcomputer-based systems.

"Business Graphics: Boon or Boondoggle?" is part of the Technology Brief series with price and availability information from Input, Suite 600, 2471 E. Bayshore Road, Palo Alto, Calif. 94303.



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Exec Cites Need for MRP Systems In All Manufacturing Businesses

By Susan Blakeney
CW Staff

CHICAGO — "How do you go to the board of directors with the problem of invalid scheduling?" mused Darryl Landvater, president of Manufacturing Software Systems, a subsidiary of the Oliver Wight Co. "Or, better still, who wants to be fired?" Landvater threw out those questions during a "Computers in Manufacturing" session at the recent Software/Expo here. At the session he enumerated the necessities of manufacturing resource planning (MRP) software systems in manufacturing businesses across the board.

"Scheduling problems are very, very insidious ... lots of people don't even realize what the problem is," he lamented. "There's a lot of finger-pointing going on in companies without valid schedules. There's a lot of funny numbers, and there's little real accountability."

The "real difficulty," in his opinion, is that "all available evidence points to something other than the scheduling problem."

Solution Is MRP

Thus, Landvater asserted that scheduling problems are at the heart of most of America's business woes, and MRP is the solution.

According to Landvater, while implementing an MRP system requires "enormous amounts of money, time and effort," the "tangible dollar benefits" that can be realized with MRP include the following:

- An increase in customer service and profits.
- Improvements in productivity.
- Improvements in the purchased-materials area.

- Reduced inventory.
- A reduction in scrap.
- Reduced special delivery and rush orders.
- Improved corporate communications.

Landvater suggested that the MRP payback can be two to three times its initial investment in the first year of use. "These numbers are conservative, and they're from

real companies," Landvater noted.

If MRP is so good, why isn't the whole world doing it? "Because it requires a new approach to business," he asserted.

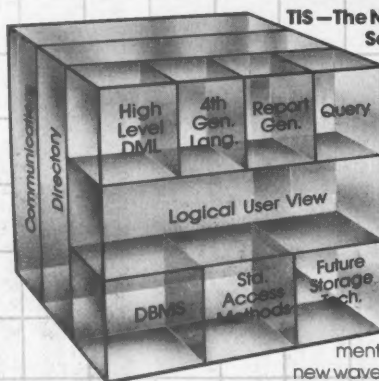
Landvater maintained that MRP is extremely people-oriented, as opposed to computer-oriented, and that this is often overlooked.



Darryl Landvater

CW Photo by S. Blakeney

INTEGRATED DATA BASE TECHNOLOGY



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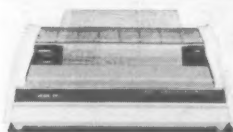
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Adapso Head Calls for Service-Oriented DP

By Susan Blakeney

CW Staff

CHICAGO — Data processing departments should become more like computer service vendors — and vice versa. The DP departments should strive to provide users with the tools they need, and they must be prepared to learn more about the companies' business; the service organizations must, by the same token, work toward

providing DPs with the technology and education they need to do their jobs well.

Those were the sentiments of Larry Schoenberg, chairman of the Association of Data Processing Service Organizations, Inc. (Adapso) and founder and chief executive officer of AGS Computers, Inc., when he charted "Where We Go From Here" at the final plenary session of

Software/Expo held here recently.

Schoenberg disputed the notion that the supply of programmers would soon exceed the demand. He cited a trend chart from a recent trade publication illustrating increasing college enrollments resulting in a huge gap between computer science graduates and corresponding employment opportunities. The logic of

these charts is wrong, according to Schoenberg, because he sees "no correlation between the number of computer science graduates and the actual number of people who enter the field."

Schoenberg also said that "there are plenty of opportunities and challenges ahead, because the backlogs are real and are getting larger all the time." Despite an ever-increasing availability of soft-

ware, he claimed there is a "two- to three-year visible backlog of projects — and an



CW Photo by S. Blakeney

Larry Schoenberg

equivalent invisible backlog."

This situation is not likely to go away, according to Schoenberg, who attributes part of the problem to the influx of microcomputers. "A whole new group of unsophisticated users," whose numbers are growing daily, are infiltrating the business world. These users are demanding user-friendly software and interface capabilities to their corporate mainframes.

Other goals that he outlined included systems flexibility and portability, to enable the user to capitalize on "the power of the computer."

Schoenberg also said that people should try harder to apply the computer to the business of the specific user company — not to be afraid to develop highly specific system software because, according to a survey he conducted, production system software averages only two runs after purchase before it has to be modified.

In conjunction with this, Schoenberg claimed that the design and maintenance processes must be viewed as a business.

Finally, he predicted:

- Much more software will be built right into the hardware.

- The large-scale computer trend will continue, while the microcomputer industry flourishes, putting the squeeze on minis.

- The "computer games" generation will lead the way to general public acceptance of computing in everyday life.

- Vendors will work on user friendliness, power and efficiency, in that order.

- DP spending will continue to be a larger and larger percentage of the overall corporate budget.

- DP solutions will continue to give companies the leading edge in business.

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Lack of Programmers a 'Sham': Pansophic Head

By Susan Blakeney

CW Staff

CHICAGO — "What Programmer Shortage?" was the name of a luncheon session held here at the recent Software/Expo, and Pansophic Systems, Inc. President David Eskra professed his belief that there really is no shortage of programmers at all.

Eskra argued that the much-trumpeted lack of qualified programmers is "a sham" perpetuated by industry and media alike. The "real problem" is gaining access to that "ton of data that has the potential to solve all kinds of business problems."

If there was no growth in data or increase in demand for the data, Eskra claimed there would be no problem. But "larger and larger backlogs of re-

quests" keep building up, and "instead of crying for more programmers, we have to start to break down the problem into workable parts."

The solution, Eskra said, does not lie in a data base management system (DBMS) because "there's a huge gap between [DBMS] planned activities and actual usage." Design problems, a lack of flexibility and technical roadblocks inherent to DBMS only serve as roadblocks to DPs and end users, Eskra said.

"People need direct access to data. Present them with a wall of information and they'll back off," he warned. Furthermore, "people don't give a damn about the structure of the data — they just want access to it."

While the information center con-

cept is "a tremendous step in the right direction," and DP steering committees and natural languages are "good ideas," Eskra considers them half-measures.

The solution is to make everyone a

programmer, according to Eskra. "We must teach everyone and give everyone the tools they need. We must do it," he emphasized, "because we perpetuated the myth" that programmers are a select breed.

CAD/CAM Seminars Scheduled For Execs Oct. 28-30, Dec. 9-11

CHICAGO — Telemedia, Inc. has announced two executive-level computer-aided design and manufacturing (CAD/CAM) seminars to be conducted by automation consultants C.H. Link of Link & Associates and Ted Smith, vice-president of Rath & Strong, Inc.

The seminars are scheduled for Oct. 28-30 in Monterey, Calif., and Dec. 9-11 on Marco Island, Fla.

The seminars will offer a basic approach to CAD/CAM, computer-aided engineering and computer-integrated manufacturing, according to Link.

Other sessions will cover computer-based engineering and manufacturing systems, organizational implications of automation, business and technical planning strategies, automation-needs analysis, evaluation process, financial management, performance factors and the long-term outlook for automation, Link said.

The seminars cost \$1,450 including lodging for three nights and some meals. Information is available from Robert Hinchey, Computer Technology Group, Telemedia, Inc., 310 S. Michigan Ave., Chicago, Ill. 60604.



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- DBMS in the Micro World: Are workable products available?
- How to select the right DBMS for your needs
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- Trends in data base machines: Why should these be selected over DBMS packages?

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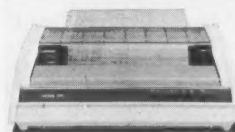
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Personal Computer, Telephone to Merge

Intelligent Telephone Coming Soon, Exec Says

By Bruce Hoard
CW Staff

SAN DIEGO — Shipments of "intelligent telephones" that combine a personal computer with a telephone will jump from 4,700 units in 1984 to 350,000 annually by 1992, Eastern Management Group President John Malone told attendees at the recent Telecommunications Association convention here.

Discussing several office automation technologies and possible vendor strategies during a session titled "Communications Managers and the Office of the Future," Malone said the marriage of the personal computer and the telephone is coming soon and is "very, very logical."

The resultant intelligent telephone will include an integral processor (at least eight bits), operating system (such as DOS or Digital Research, Inc.'s CP/M), the ability to download programs and upload data, a CRT screen, keyboard and telephone.

Vendors of such devices probably will include Mitel, Inc., Northern Telecom, Inc. and Rolm Corp., Malone predicted. Mitel has taken a step in that direction with the introduction of its Kontakt personal workstation, which Malone said is available in the U.S. despite earlier Mitel claims that it could only be purchased in Canada.

Northern Telecom's Displayphone could be altered to become an intelligent telephone, and Rolm is a likely participant because it needs to sell something other than private branch exchanges (PBX) in order to continue its rapid growth, he maintained.

Mitel's Kontakt terminal costs \$4,000, but Malone said prices for such terminals and intelligent telephones will drop quickly as technology advances.

IBM/AT&T Deal

Turning to voice store-and-forward systems, Malone said AT&T may breathe some life into that struggling market by purchasing a package from IBM to run on an adjunct processor of its Dimension PBX — "maybe by next year." Such a move could be good for Bell in the short term, but inimical over time, he said.

Electronic mail has not been widely accepted by the user community for several reasons, Malone claimed. Users are concerned about what he called "cross-elasticity," or the com-

patibility of electronic mail and electronic voice store-and-forward systems. Malone himself is "not sure" if the two can work together.

Confusion about software options and the cost of mass storage are two other factors holding potential electronic mail users back, he said, adding that mass storage "is not going to be an issue very long at all."

"There is also a turf problem just beginning to surface," he said. In the past, communications managers were content to let DP managers control electronic mail, but that may be changing as more communications companies offer DP-type packages.

As an example, Malone predicted

AT&T might unveil a terminal designated "Get Set" with an electronic mail software package called "Epic." The office automation vendors to watch in the near future are AT&T, American Bell, Inc., with its Bell operating companies, and IBM, he said, noting that those firms want users to think they have the "system solution" for all their information handling needs.

IBM, he said, "will engulf businesses with total solutions." IBM will not, however, be big in the PBX market because it sees large computers as the hub of the office of the future, according to Malone. IBM will be big in local-area networks and personal

computers. By 1987, it will have 15% of the local-area network market share and 10% of the personal computer market share, he predicted. The PBX will remain AT&T's office hub, the consultant said. The Dimension PBX has been enhanced and the long-awaited Antelope digital PBX will be implemented slowly as demand for it grows.

American Bell and the operating companies will be potent competitors in the office automation market, Malone asserted. "Nobody is performing frontal lobotomies on these people before they jettison them from the main company," he observed.

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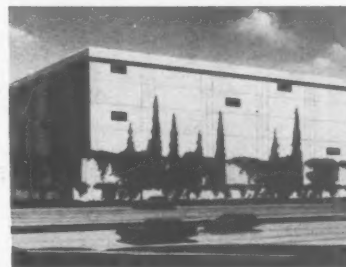
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Bell Exec Says Fiber Optics Key to AT&T Future

By Bruce Hoard

CW Staff

SAN DIEGO — AT&T can transmit 280,000 calls simultaneously over the 72 fiber-optic strands connecting Boston to Washington, D.C. In addition, Bell could offer fiber optics service for one cent per circuit mile if it chose to do so, according to Bob Bishop, Bell's director of intermediary marketing.

Speaking at the recent Telecommunications Association conference here, Bishop made it plain that the future of AT&T is bound up with fiber optics technology. "Bell feels it is the answer to the terrestrial transmission situation," he said.

Noting that voice and data are implemented on one fiber-optic chan-

nel, Bishop told his audience that when the Boston-Washington, D.C., link was first brought up, only 80,000 simultaneous calls could be facilitated. However, Bell expects to increase the current capacity of 280,000 by incremental factors of 10 in the future, he declared.

Although the telephone company could theoretically offer fiber-optic circuits for one cent per mile if 50 million simultaneous conversations were being carried, Bishop said such a low price will probably not be offered because of the marketing maxim that states that fiber-optic service is perceived as being better than satellite service and should thus cost slightly more.

AT&T has depended on analog

transmission for so many years because the company felt digital technology was too expensive. Now that a commitment to digital transmission has been made, the company is going with fiber-optic cable to the exclusion of the more commonly used coaxial cable. Bishop said Bell is laying only one more major coaxial-cable

connection.

Mapping future plans, Bishop said that links between Boston and Washington, D.C., and San Francisco will be operational by 1984. By 1987 Bell will have laid fiber-optic cable to Europe, and by the early '90s the company will be offering a nationwide, interstate fiber-optics-based service.

Exec Reviews Costs, Modes Of Satellite Transmission

SAN DIEGO — The annual cost of buying a satellite transponder has risen from \$1.2 million in 1974 to \$1.7 million in 1982, and prices for

satellite transmission have been increasing at a rate of 6% a year, M.J. Drach, assistant vice-president of American Satellite Co., said at the recent Telecommunications Association conference here.

A transponder is a passive repeater that receives an earth station signal, repeats it and sends it back to earth. In so doing, it changes the frequency and "cleans" the signal up, Drach explained. An average satellite may have 10 transponders, each of which can handle 1,500 to 2,000 voice-grade circuits.

Satellite transmission is cheaper than terrestrial services for long-haul connections, according to Drach, in addition to being more flexible and reliable. He cited one company that had realized a 50% savings by switching from terrestrial to satellite communications.

There are two frequency bands commonly used by satellites. The first is known as C Band. C Band has been used since satellites started becoming popular communications vehicles around the mid-'70s. It uses 6 GHz on the up-link and 4 GHz on the down-link at 5W of power. The problem with C Band is the earth stations used with it in metropolitan areas interfere with other nearby transmissions.

That problem led to the development of K Band transmission, which uses 14 GHz of bandwidth on the up-link and 12 GHz on the down-link at 20W of power. However, K Band is not without its problems, Drach said, adding it is susceptible to rain attenuation.

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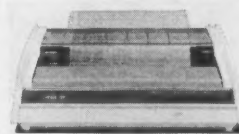
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Competition Said Key to Short-Haul Rates

By Phil Hirsch

CW Washington Bureau
WASHINGTON, D.C. — "Aggressive competition" will cause long-haul communications rates to fall and the lack of competition will force short-haul and local-exchange rates to rise by a factor of two before the end of the decade, J. David Hann, president of GTE Telenet Communications, said in his keynote address at the recent

Comcon conference here.

Hann also believes international tariffs will decline, but that the extent of the drop will depend on the attitudes of foreign telecommunications administrations, which currently are reluctant to accept lower rates.

Hann contended that terminal equipment will become significantly more cost-effective in the '80s, partly because of pro-competitive

decisions made in Washington. As a result, computers and telephones "can be furnished today by any party, including computer manufacturers, telecommunications manufacturers as well as carriers such as [AT&T] Long Lines," he pointed out. "Consequently, the sharp distinctions between voice-switching equipment and data processing equipment will fade," and the more ver-

satile equipment that results will be more cost-effective than what is available today, Hann added.

AT&T Suit Settlement

Regarding the AT&T antitrust case settlement, Hann chastised the Justice Department and federal Judge Harold Greene, who has the final word regarding the terms of the settlement, for not recognizing "that AT&T

Long Lines will retain more than 95% of the intercity telecommunications marketplace, clearly a dominant position."

He continued, "I can see no justification for the suggestion made in some quarters that the separation requirements imposed on AT&T in the [Federal Communication Commission] FCC's Computer Inquiry II orders be relaxed... AT&T's enhanced services business must obtain transmission channels on the same basis as its competitors."

Hann is also concerned about the ability of the to-be-divested Bell operating companies to improve the cost-effectiveness of local telecommunications facilities. Pointing out that the settlement agreement will deprive the operating companies of the centralized engineering, planning and research capabilities of the Bell system, he said "it would be disappointing if, with all the remarkable advances that... are emerging in integrated customer premises systems, the cost and capabilities of telecommunications remained unchanged because the Bell operating companies... were unable to improve [their] facilities at a rate commensurate with advances in other areas."

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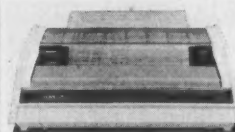
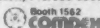


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Route Coding Package Reduces Mailing Costs for Power Company

MILWAUKEE — In the face of rising utility rates, Wisconsin Electric Power Co. was looking for ways to keep operating costs to a minimum.

Seeking to reduce costs, the power company decided to take advantage of a recently adopted U.S. Postal Service regulation that allowed companies to save one cent on each piece of mail that is pre-sorted and coded according to carrier routes.

The post office has not made a widespread announcement of the discount. However, because Wisconsin Electric sends out 45,000 pieces of mail each day, the U.S. Postal Service was eager to have the utility company take advantage of the savings.

What was needed was an application system that could put carrier route codes on the firm's master records. Wisconsin Electric needed a system that could operate with its IBM 3033 processor and plug into its bill print subsystem.

Immediate Acceptance

Although there were few packages available, the firm decided on the Carrier Route Coding System (CRCS) from List Processing Co., according to George Simmons, superintendent of administrative services for the power company. List Processing Co. did a run for the firm and "we accepted the product immediately," Simmons said. The only other packages available to do this sort of application were produced by "garage" software operations, he recalled.

In choosing a system Simmons had two criteria. The first was finding a way to perform the application without having to change or maintain the data on the master files. "The ability to come in with other files and not have to change the master files to carry additional information is a much more efficient technique," Simmons said.

Moreover, Simmons also wanted to assure the accuracy of the carrier route codes in the data base and make sure the codes could be updated quickly. If there is an error factor of 5% in the carrier route codes put on the pieces of mail, the mailer loses the discount for all pieces going to that Zip Code.

Currently, the Postal Service issues a tape with the carrier routes listed, but when CRCS was developed that listing was not available. Consequently, List Processing compiled a data base of

all the codes. Now, the firm takes the post office's tape and verifies all the codes before changing them.

Minimal Customizing

The system took one-and-a-half man-months to install. The amount of customizing needed was minimal. Simmons said CRCS also has some report features avail-

able, but his staff preferred to develop their own reports.

After two months of use, Wisconsin Electric found the percentage of its mail that qualifies for the discount is as high as originally anticipated.

Since installing the system, the utility company reports it is saving \$120,000 a year in postage costs.

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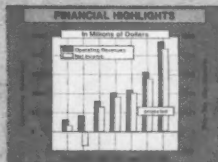
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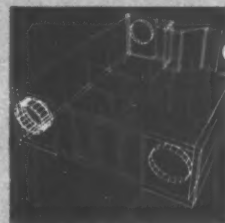
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How Can Coordination Be Initiated?

Q We have our share of the typical DP problems, but have not made any real progress toward resolving them. As a result, new projects are dying on the vine for lack of cooperation from users and for lack of coordination within DP.

The situation hasn't changed much in the last five years. The same people are faced with the same problems. Limited resources, unrealistic deadlines and a substantial backlog have discouraged any real positive action.

I've recently been promoted and am now a part of the decision-making group. I'm the first new addition to the group in over five years.

Reluctant to communicate con-

cerns to the other members of the management group, the rank and file have identified with me. They are depending on me to take the initiative and get the ball rolling in the right direction for the sake of the company and to keep their careers from stagnating. Do you have any suggestions as to how to initiate this turnaround?

A With such limited information, I'm reluctant to lay out a turnaround plan, but perhaps I can identify the major stumbling block.

Problem, and even solution, identification is not all that difficult. The difficulty comes in making the decision to commit the necessary re-

sources. These decisions often require individual and company sacrifices and, therefore, are sometimes delayed indefinitely. This only prolongs an uncomfortable and unproductive situation.

You and your colleagues have a responsibility to make some bold (and often risky) management decisions. A recession is no time to practice status quo management.

Ask the other members of the group if they want to continue in survival mode or put priorities into perspective and get on the track to more and better information services. Free up necessary resources by issuing the death certificate to projects that are "dying on the vine."

Turnaround Time

By Larry E. Long

Q Briefly stated, my problem is selecting a strategy in making a double transition from the military to civilian life and from an operations research background to a data processing career.

My academic credentials include an M.S. in operations research. By the time I retire, I will have completed about 40 hours of data processing courses at a local community college.

My work experience has, like most career officers, been extremely varied; however, I have spent the last six years in OR-type work. As a result of my academic and work exposure, I have programming experience in Fortran, APL, Cobol, PL/I and SPSS.

What kind of position should I pursue in making what can best be described as a lateral move into DP?

A The OR group is often organizationally located within information services, especially in larger companies. With the emphasis on decision support systems, more and more OR assignments are in the mainstream of information systems development activities.

Typically, the minimum education requirements for new OR employees is a master's degree. Because of your OR experience and education, and your desire to move into DP, I think your best bet is to pursue an OR position in an information services department.

Q My husband is a professor and teaches Cobol programming. I'm also a Cobol programmer. We would like to try contract programming, on a limited basis to start. We would appreciate your advice on what kind of companies to approach and how.

A To get started you will have to step out of the mold of a Cobol programmer. You have to make people aware of your skills and availability. In part-time contract programming, you are the marketing representative and therefore, must sell yourself and your services to potential clients.

With a little persistence and a small investment, you can inform people of your availability via word-of-mouth, telephone and personal letters. As to what kind of companies to approach, leave no stone unturned.

Long is a professor at Lehigh University, a DP consultant and author. If you have a question you'd like him to address, send it to Larry Long, Editorial Department, Computerworld, P.O. Box 880, Framingham, Mass. 01701.

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Managers on the Move

DENNIS J. MURPHY has been appointed director of decision support systems and RAYMOND A. PALKOVIC has been named director of systems consulting in the headquarters information management services department of GTE in Stamford, Conn.

Murphy is responsible for supporting the decision-making process of GTE management personnel at all locations. Palkovic advises GTE headquarters departments on office automation and recommends appropriate business and data processing systems.

Palkovic has served as data processing services manager of GTE since 1979. He joined

GTE Automatic Electric in 1966 and served in various positions, including operations analyst and senior programmer. He was named manager of systems and data processing in 1971. Before joining the company, he was a systems analyst with Hammond Corp.

Murphy began his GTE career in 1968 at the company's Entertainment Products Division in Batavia, N.Y. He held various managerial positions, including manager of strategic planning in 1972. He came to GTE headquarters as manager of financial studies and procedures in 1976 and was named senior business consultant in 1979. He was appointed manager



Dennis J. Murphy

of decision support systems in 1981. Prior to joining GTE, Murphy held a teaching fellowship at Boston University. Earlier, he served in engineering capabilities at Boston Edison Co. and Northeastern University.

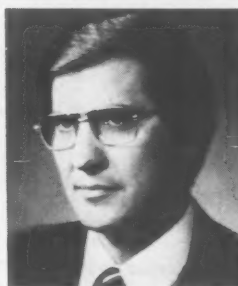
Murphy received a B.S. degree in electrical engineering from Northeastern University, an MBA degree from Boston University and an M.S. degree in applied statistics from Rochester Institute of Technology.

H. THAINE LYMAN JR. has been elected a principal of Touche Ross & Co. headquartered in Chicago. He has been specializing in systems consulting and has implemented major logistical management systems for several manufacturing and distribution companies. He also has been responsible for operations improvements and systems consulting engagements for insurance clients.

Lyman joined the firm as a management consultant in 1977. He began his career as a data processing planning analyst for Kemper Insurance Companies and later served as manager of network design for Continental Bank in Chicago before joining Touche Ross. He was promoted to senior consultant in 1978 and manager in 1979.

Lyman received a BBA degree in marketing from Loyola University and an MBA degree in finance from Northwestern University.

PATRICK J. FORTUNE has been appointed director of information services at Baxter Travenol Laboratories, Inc., a manufacturer of medi-



Raymond A. Palkovic

cal care products headquartered in Deerfield, Ill.

Fortune, who has been with the company for four years, was most recently associate director of domestic systems. He holds a B.A. from the University of Wisconsin, Stevens Point, and a doctoral degree in physical chemistry



H. Thaine Lyman Jr.

from the University of Wisconsin, Madison. He is a member of the Association for Computing Machinery, Sigma Xi (Honorary Research Society of North America), American Physical Society and the American Association for the Advancement of Science.

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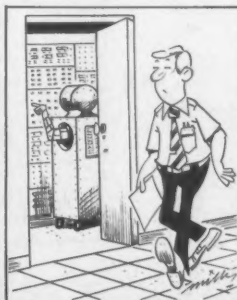
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Hunt-And-Peck Author/Geologist Finds WP System Hits Right Key

DENVER — Author and geologist Ron Redfern found himself in a bind when he started work on *Corridors of Time* in 1979. Because of his extensive travel schedule, he was unable to engage a full-time secretary. And as a self-confessed "hunt-and-peck" typist, he had no desire to prepare the 70,000-word manuscript by himself.

Redfern found his solution at the Denver offices of his lawyer. The firm had been using an NBI, Inc. System 3000 word processor for several years and was satisfied with it. Seeing that word processing could be the answer to his problems, Redfern began to shop for a system of his own.

"At first I was frightened to

death by the machine, but as I looked closer at it, I realized what a useful tool it could be," said the British-born Redfern. "I looked at word processing systems from Wang Laboratories, Inc. and Xerox Corp., but finally settled on the NBI. Without even knowing how to type, I bought one."

The system he purchased consists of a keyboard, video screen, letter-quality printer and floppy disk drives, all contained within the unit, as well as standard NBI word processing software.

Writing the Book

Following a one-week training course from NBI, Redfern set out to write his book. He budgeted a year for the project, and initially it seemed that it might take him that long.

"I had problems at first with getting into a mode and not knowing how to get out," Redfern said. "But NBI's service department was most helpful. All I had to do was give them a call and they would get me out of the problem over the phone."

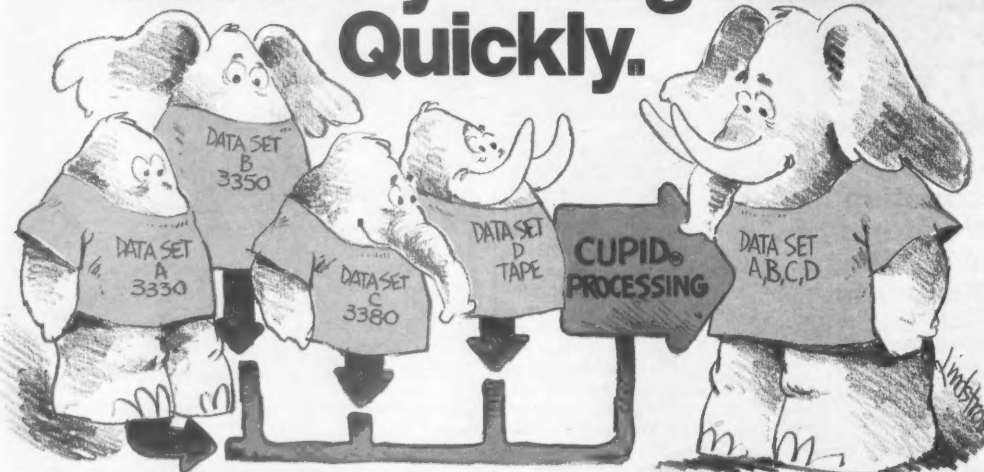
It took Redfern nearly a month to write the first chapter of his 10-chapter book. But the tenth chapter took only 10 days. Within six months, Redfern's manuscript was finished.

"There is no way I could have finished the book in under a year without the machine," said Redfern, now a word processing enthusiast. "When I bought it, I was simply trying to overcome the problem of not having a skilled secretary. But once I began using the word processor, I came to regard it as a creative tool."

Redfern said the machine "disinhibited" him as a writer. "My job is ideas and how to express them," he said. "I can use this machine creatively, playing with words and refashioning them without bothering with crossing out. If I have an idea in the middle of a page, I can simply push it down to the bottom of the page and come back to it later. Nothing I do is ever lost if I don't want it to be. As a result, the quality of my work has improved noticeably."

Although word processing software has evolved in the three years since he bought his system, Redfern has had no trouble keeping up with the times. "My system is never really outdated," he said. "When a new word processing release comes out, a representative drops by with a disk and I copy the latest software onto my system."

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Oct. 12, New York — **CICS/VS Command Level Debugging.** Contact: Teltech Systems, Inc., 548 Fifth Ave., New York, N.Y. 10036.

Oct. 13, Waltham, Mass. — **Computer Law Forum.** Contact: Chase Econometrics/Interactive Data Corp., 486 Totten Pond Road, Waltham, Mass. 02154.

Oct. 14-15, Washington, D.C. — **The Seventh Annual Association of Public Data Users (APDU '82).** Contact: APDU, 87 Prospect Ave., Princeton, N.J. 08544.

Oct. 18, Boston — **MVS: For Cobol Programmers.** Contact: Computer

Education Services, 739 Boylston St., Boston, Mass. 02116.

Oct. 18, Boston — **Advanced PL/I.** Contact: Computer Education Services, 739 Boylston St., Boston, Mass. 02116.

Oct. 18, Boston — **DOS/VSE: For Applications Programmers.** Contact: Computer Education Services, 739 Boylston St., Boston, Mass. 02116.

Oct. 18-19, Washington, D.C. — **IMS/VS Dump Reading.** Contact: Data Base Management, Inc., 281 Hartford Tnpk., Vernon, Conn. 06066.

Oct. 18-19, St. Louis — **Increasing Software Productivity.** Contact: The Education Foundation of the Data Processing Management Association, Department ISP, P.O. Box 91295,

5959 W. Century Blvd., Los Angeles, Calif. 90009.

Oct. 18-19, New York — **Data Administration: Successful Techniques.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Oct. 18-19, Cincinnati — **Software: A Legal Briefing for DP Professionals.** Contact: The American Institute for Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07940.

Oct. 18-20, Washington, D.C. — **National Conference on Using Small Computers: Implementing Integrated Information Systems.** Contact: U.S. Professional Development Institute, Small Computers Confer-

ence, Department 123, 12611 Davan Drive, Silver Spring, Md. 20904.

Oct. 18-20, Chicago — **DP Operations Today: Effective Scheduling and Console Operation.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Oct. 18-20, Chicago — **Word Processing Systems: Planning, Design and Operation.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Oct. 18-20, Boston — **Unix Fundamentals for Programmers.** Contact: Computer Technology Group, Telemedia, Inc., 310 S. Michigan Ave., Chicago, Ill. 60604.

Oct. 18-20, San Francisco — **Data Base Management Systems: A Comparative Analysis of General-Purpose Systems.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

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Oct. 18-20, Los Angeles — **Structured Testing: Tools and Techniques.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Oct. 18-20, Chicago — **Data Processing: Fundamental Concepts.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

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Oct. 18-22, St. Louis — **CICS Command Level Application Programming.** Contact: Washington University Center for the Study of Data Processing, Washington University in St. Louis, Campus Box 1141, St. Louis, Mo. 63130.

Oct. 18-22, Washington, D.C. — **How to Increase the Productivity of Computer People.** Contact: Keston Associates, 11317 Old Club Road, Rockville, Md. 20852.

Oct. 19, Los Angeles — **Writing User Manuals That Sell.** Contact: Promptdoc, Inc., 833 W. Colorado Ave., Colorado Springs, Colo. 80905.

Oct. 19-20, Philadelphia — **Magnetic Tape Library Management Seminar.** Contact: Tape Library Consulting, 3 Royal Road, Yardville, N.J. 08620.

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Oct. 19-21, Winnipeg, Manitoba — **Computer Technologies for Productive Learning.** Contact: Ken Charbonneau, Conference Services Office, National Research Council of Canada, Ottawa, Ontario, Canada.

Oct. 19-21, Los Angeles — **Disaster Recovery Seminars.** Contact: DP Security, Inc., 181 West St., Waltham, Mass. 02154.

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EDITORIAL

Why They Stayed Home

At a time when most systems professionals seem to agree that software will provide the solutions for current and future business information problems, it is curious that so few turned out at the recent Software/Expo in Chicago.

The national show, now in its third year, has had only limited success in rounding up attendees. Only as the event neared its final hours did attendance figures creep toward the anticipated 10,000 mark [CW, Sept. 27].

Some speculated that the rail strike kept away attendees coming from outlying areas this year, but most conference-goers fly into the host city and would not be affected by such problems. Others claimed that corporate budget cuts are forcing them to travel more selectively.

One major software vendor lamented that it costs him \$10,000 to be represented at such a show and "it's just not worth it." On the other hand, such frugality did not keep the 1982 National Computer Conference — a show that reportedly costs vendors upwards of \$300,000 to exhibit their wares — from bulging toward 93,000 attendees.

One theory advanced to account for Software/Expo's sparse attendance — despite free admission to the exhibit floor — is that there is not very much to see at a software show. Visually, it's hard to demonstrate software in an exciting way, so the people who browse at the more hardware-oriented shows stayed home.

Or maybe the show is just poorly promoted and managed. A joint venture of *Infosystems* magazine and the Association of Data Processing Service Organizations, Inc., Software/Expo seemed to lack any real focus or coherent theme. The sessions ran the gamut from financial systems to manufacturing software solutions to business graphics to microcomputer packages. These supposedly "dynamic conference sessions" fell short of the "valuable and rewarding" experience they were promised to be, and quite often they strayed widely from their scheduled topic areas.

Perhaps the real reason for the show's poor attendance was the difficulty it experienced bridging the gap between what it promised and what it delivered.

DATA PAST

Five Years Ago Sept. 26, 1977

LAKE BLUFF, Ill. — Although the economy was looking brighter, DP salaries rose more slowly from June 1976 to June 1977 than they did from June 1975 to June 1976, according to the annual *Hansen's Weber Salary Survey*.

Salaries grew at 5.1% from 1976-1977 compared with a 5.7% increase the previous year, the report said.

Top DP managers fared the best in salary hikes, experiencing an 11.2% increase amounting to an average salary of \$36,036 nationally.

SAN FRANCISCO — A five-woman, one-man jury ordered IBM to pay Forro Precision, Inc. \$2.7 million in a verdict on Forro's charges that IBM interfered with its components business.

The jury failed to reach a verdict on the antitrust charges pressed by Forro.

Ten Years Ago Sept. 27, 1972

WALTHAM, Mass. — Honeywell, Inc. introduced two computers to its Series 2000 family and announced major enhancements including communication facilities for its small Model 58 computer system.

The additions, the 2040A and 2050A systems, could be upgraded at the customer's site by adding power modules and memory units.

DES MOINES, Iowa — A lawsuit was filed here aimed at prohibiting all Iowa law enforcement officials from keeping either computerized or manual identification files on arrested persons with no criminal convictions.

Freeland Walker, then a 20-year-old Des Moines youth who had seven felony arrests — but no convictions — filed suit as a class action. The suit charged the state with "invasions of privacy."

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LETTERS

Senior Execs, Wake Up!

When are the senior executives of the computer users of the nation going to wake up?

In ad after ad in *Computerworld* or the daily newspaper the copy reads: "DP Manager Wanted, Experience Required." Or "OS MVS, CICS, Unix, IMS, RPG assembler, IBM, Burroughs, Honeywell" ad nauseam.

Who is writing these advertisements? Other DP managers? Mr. Senior Executive, do you speak all those languages? If you do, you are indeed a rare bird. If you are the typical executive, you probably think in terms of budgets, planning, "bottom line," cost-effectiveness, assets, liabilities or possibly even information resources. Why would you even want to hire a manager who does not speak the same language you do?

I am a DP director for a large mortgage company. In that capacity, I am responsible for (but not involved in) the day-to-day operations of this department. I have had technical training in various languages and systems in my 20-plus years of DP, but I don't have the desire or need to communicate in bits and bytes.

I haven't coded a program in years, nor do I intend to. I could manage a programming staff of any size, in any language, in any systems environment, using the same management techniques and methods.

Eighteen months ago I didn't know a mortgage from a mortgagee, but I have learned what I needed to know to produce a responsive, user-oriented department; and I never spoke a word of Cobol to anyone. I report to the board of directors and they don't know a computer from a breadboard. They do, however, understand results and cost-effective or efficient user systems.

Over the years I have made sure I stayed up to date in most manage-

ment methods. I have taken courses and attended seminars in management topics. I have operated in a variety of business areas, ranging from the manufacture of panty hose to medical insurance claim processing. Who cares if I can speak Cobol, CICS or Unix?

So here, Mr. President or board chairman or whomever your DP manager reports to, is my recommendation:

The next time you are hiring a DP manager or are considering replacing him for whatever reason, maybe you should train him to be what you really want, a manager and not a technician. If you do have to recruit, advertise for what you are really looking for, someone who speaks your language, not Cobol, OS MVS and so on. If you need a programmer, hire one. A manager that is programming is not managing.

Douglas Grace
Data Processing Director
National Mortgage Co.
Memphis, Tenn.

Keep Up the Good Work

I enjoyed the In Depth article "The Birth of AIS/Net1" [CW, Aug. 30]. I thought it was thorough and accurate.

In addition, I believe many of Walter Levy's forecasts of the risks and opportunities are correct. In particular, the difficulties of securing agreement between a diverse group of users — despite their common interest — on protocols and data standardization sometimes outweigh the value of the effort.

Keep up the good work.

Arthur J. Marks
Senior Vice-President
Programs Management Operations
General Electric Information
Services Co.
Rockville, Md.

HUMAN CONNECTION / Jack Stone†

Training Operators by the 'Sink or Swim' Style

In a field so filled with intellect and logic, it is amazing to find that many people in this business put a lot of time and attention into systems development, but give short shrift to the development of operating personnel.

For instance, take on-the-job training (OJT) for terminal operators. This involves access to a large and complex system. There is a widely held notion that these trainees, to learn their job skills, need only "hang around" an experienced operator and the information will "rub off."

Surely you've overheard supervisors issue such gems as these when starting up a new employee:

"George, I want you to sit alongside Maybelle for a week or so to 'get the hang of the operation' and then you'll be ready to take over your own terminal. Thereafter, if you have problems, just corner whoever's around. But remember, we expect you to handle the majority of questions on your own."

Good News

Of course, some learning takes place under these circumstances — albeit at varying rates, depending on the training situation — and that's the good news.

Now here's the bad news. What is normally learned during the OJT experience is limited to a set of keyboard procedures. Rarely does it pro-

For instance, take on-the-job training (OJT) for terminal operators. This involves access to a large and complex system. There is a widely held notion that these trainees, to learn their job skills, need only "hang around" an experienced operator and the information will "rub off."

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vide the "systems understanding" that is so necessary for operating effectiveness.

Typical OJT programs are notoriously bereft of structure. Unknowing trainees often have difficulty making "heads or tails" out of a program because the "Maybells" of this world transfer information on a haphazard and piecemeal basis.

For some strange reason, most supervisors expect a trainee to perform properly at the terminal before the person is fully trained.

These supervisors are not wonderfully understanding, and more than likely they are intimidating if the

trainee has difficulties, a situation that hardly builds mutual trust and confidence.

OJT programs are usually provided without specific goals. As a result, learning is not measured — or measurable. Furthermore, the training is not standardized and trainees may wind up with varying levels of knowledge.

Training Objectives

Like any other systems project, OJT must be conceptualized, organized, specified, budgeted, developed, documented, staffed and implemented to meet specific goals and objectives.

In particular:

- "Maybells" should be selected on the basis of their communications and training skills as well as their technical knowledge. They should receive "train-the-trainer" briefings from professionals to improve their effectiveness.

- The training should be organized as modules, each with a set of goals that represent the expected capabilities of the trainee upon completion. Topics to be addressed within each module should be sequenced in a coherent way. This material should be reduced to writing and given to the "Maybells" for guidance purposes.

Obviously, by using the same material with all trainees, the OJT program becomes standard. Also, as stated earlier in this series, the material delivered as part of OJT should be closely coordinated with formal training for purposes of reinforcement.

- Exercises, quizzes and exams — preferably given in a self-administered manner — should be included for additional reinforcement. Even more importantly, these drills help the trainees measure their progress and gain a sense of where they stand.

This is the fifth article in a six-part series, "Trials of a New Terminal Operator," coauthored with Joanne Barker.

Letters to Stone should be addressed to him at Box 270, 1377 K St. N.W., Washington, D.C. 20005.

READER COMMENTARY / David E. Monarch†

Distributing Resources and Responsibility

The computing system of an organization may be characterized by its position along two interrelated dimensions: the distribution of physical resources and their level of interconnection and the distribution of responsibility for the resources. Other dimensions exist; however, these are the most relevant for this discussion.

The distinction between a building that houses computers, the computers themselves and the organization that administers them (maintenance, operations and so on) is critical. A company blurs this separation by using the label "computing center" to refer to a building, a building with computing equipment in it or the people in an organizational unit housed in that building.

This discussion will force a partial separation of the labels by using division of computing services (DCS) to represent the organization, computing center (CC) to represent a collection of at least one multiuser processor and computer building (CB) to represent the location of the principal CC, if there is one in the system.

Physical Resources

Nondistributed or physically centralized: The computing equipment and access devices are located at one site.

Distributed computing or distributed access: The processors are located

at one site, but the means to access them — the terminals — are dispersed.

Distributed processing: Multiuser processors are located at points of user concentration. Access may then be further distributed.

A microprocessor connected to a central computer is nominally part of a distributed access rather than a distributed processing environment. The distinction revolves around the multiuser aspect and can become fuzzy in particular situations.

Responsibility

Centralized: The maintenance and operation is the responsibility of a single organizational unit that "owns" the resources irrespective of their location.

Decentralized: The maintenance and operation is the responsibility of the particular organizational unit that "owns" the resources. The following examples will clarify these distinctions.

1. A CC with terminals in the CB administered by the DCS is nondistributed with centralized responsibility.

2. If the terminals are now placed in other buildings with no change of responsibility, then this is distributed access or distributed computing with centralized control.

3. Next, multiuser processors could be installed in the other buildings

yielding a distributed processing environment with centralized organization.

4. If the processor in each building becomes the responsibility of the local group, then the processing remains distributed, but the control is a blend between centralized for the principal CC and decentralized at the distributed sites.

5. If the CB is closed so that only the local processors remain, the computing is distributed and decentralized.

6. Finally, if there is no CB/CC complex but the DCS is responsible for the local processors, then the computing is centralized with distributed processing.

Physical Connection

The physical connection between computers has not been addressed. These linkages lead to another level of ownership and control.

It is possible to have a DCS responsible for the communications network with local ownership and control of the processors themselves. In other words, there is centralized/decentralized control of the processors and centralized/decentralized control of the communications systems. However, fully decentralized communications is inherently risky.

The location of computing equipment should be dictated by technical and organizational efficiency rather

than a territorial "I've got one, too," philosophy. There appears to be no danger of a motor pool coming into existence for each department in a company — presumably the ego enhancement is less.

In general, the equipment should be placed so as to minimize the cost of operations maintenance and communications.

Yet there are some notable exceptions involving special needs or purposes. First, real-time process control or experimentation environments may require stand-alone dedicated computing systems to ensure the required response time.

Second, specific research projects may require immediacy of the resource. The important consideration is the need for physical proximity to a computer vs. the need for access to a computer.

The most likely cost trade-off will be reduced cost of maintenance and operation due to consolidation of physical location against possibly increased communications costs. The latter is "possible" rather than "certain" because the cost of direct processor-to-processor communications over a mile is much greater than terminal-to-processor over the same distance.

Monarchi is director of the Division of Information Science Research at the University of Colorado's College of Business and Administration.

Going Beyond 'Big Eight'

It has occurred to me that the editorial "Don't Quote Me" [CW, Aug. 9] should have gone beyond the Big Eight accounting firms. The world is full of "consulting firms" whose only purpose on this earth is to create havoc for client companies, especially in sensitive areas such as DP.

It has been my experience in dealing with these firms that they will stop at nothing to create problems where none existed before. If they should come across a real problem, they spend most of their time trying to find a scapegoat, instead of helping to solve the problem.

After all, unless someone in upper-level management is wise to them, the more "problems" the more money to make.

In my dealings with these "consulting firms," I have found their per-

sonnel to be arrogant, condescending, uncooperative, demanding and spending most of their time trying to find a DP staffer to blame for their failures. These failures generally result from their tendency to overcomplicate their projects.

At this point they have already found some "uncooperative" DPer on whom to place the blame. An "uncooperative" DPer is anyone who resents being treated with no respect for his professional knowledge or as a tool to be used by the consulting firm as it sees fit.

Heaven help the DP staffer who attempts to point out a more efficient way of doing something or uncovers a "consultant's" mistake. You had

better have another position to go to before tangling with the consultant. After all, upper-level management must answer for the large sums of money paid to the consulting firm. And they will more than likely back the consulting firm over their own staff.

There are good and reliable consulting firms around. It is just unfortunate that I have not had the pleasure of dealing with one.

Name Withheld by Request

Top Executive View Needed

Computerworld's editorial on the effects of Big Eight accounting firms on DP organizations ["Don't Quote

Me," CW, Aug. 9] and the letters to the editor in response are accurate — from two points of view. There are two other frames of reference, the consultant and executive management.

The consultant is in the position of providing a service for a fee. In an audit he must be critical for two reasons: client management expects it for the fee paid and the potential legal difficulties to the accounting firm if "undiscovered" weaknesses contribute to a fiscal fiasco.

In systems development contracts, the motivation is to meet the estimated schedules and therefore make a profit, to ensure upper-management satisfaction so future services can be sold and to protect the audit account, the mainline business.

These differences in objectives from DP management will certainly result in the consultant being in conflict with and going over the head of the DP staff. Their goals are different.

The missing perspective is that of top executive management. Since the top executive perspective of DP is controlled partly by upward communication from DP management, it is clear that this communication is critical if the firm is to benefit from consulting services, and more importantly, for the DP manager to survive.

Could readers provide more of the top executive view?

Bernard T. Newland

West Linn, Ore.

Table Search Method

A Cobol programmer faces table searches many times in his short programming career.

There is a very efficient table search method that programmers never use. In a table search routine basically two instructions are formulated: 1. Have I reached the end of the table? 2. Have I found the item I am looking for?

If the two instructions could be reduced by one, the production could be increased considerably, especially if the routine is invoked many times.

In order to achieve this objective, a programmer should increase the length of the table by one element. The search key should also be moved into the very last item of the table.

Therefore, one does not have to ask if one has reached the end of the table, since the element will always be detected either in its proper location or at the very end.

After the exit from the search routine, one has to determine the size of the index. If it is at the maximum, the item has not been found. Otherwise, one has located the required item.

Ahmad Ahmad

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Finds Consolidation Tasks Handled

RDC Report Examines DSS Capabilities

STAMFORD, Conn. — Decision support systems (DSS) are expanding to handle such advanced consolidation features as currency conversion, allocation-of-head-quarters costs, partial ownership and cross-company reporting.

This is the conclusion of Real Decisions Corp. (RDC), which has released its most recent *Financial Modeling Decisions* report. The latest edition reviews 25 products (Figure 1) that solved a short-term model problem proposed by RDC to demonstrate the products' capabilities in these consolidation tasks.

The approaches to the problem included:

- Use of a separate consolidation module or solution within the basic language.

- One all-encompassing model or several linked by commands in a main model or command file.

- A separate data file for each company or all data in one file.

The RDC report includes codes used to solve portions of the short-term model. These "hands-on" sessions were annotated by RDC to highlight the particular features of each language to enable analysts to compare the approach of various products and to analyze the inner workings of each decision support system.

In addition to the short-term model, the report includes the packages' responses to

| System | Author |
|-------------|--|
| Autotab | Capex Corp. |
| CSS/Final | National CSS, Inc. |
| Cuffs | Cuffs Planning & Models, Ltd. |
| Dollarflow | Quasar Systems, Ltd. |
| DSS/F | Ferox Microsystems, Inc. |
| EIS | Boeing Computer Services Co. |
| Empire | Applied Data Research, Inc. |
| EMS | Economic Sciences Corp. |
| Express | Management Decision Systems, Inc. |
| FCS-EPS | Evaluation and Planning Systems |
| Feast | Economic Analysis Software |
| Foresight | United Information Services, Inc. |
| FPS | STSC, Inc. |
| IFPS | Execucum Systems Corp. |
| Impact | MDCR, Inc. |
| Maps | Ross Systems, Inc. |
| Model | Lloyd Bush & Associates |
| Prophit II | Control Data/Business Information Services |
| QED/Insight | Time Sharing Resources, Inc. |
| Simplex | Simplex Systems, Inc. |
| Spread | Spread Financial Analysis and Reporting System |
| Stratagem | Integrated Planning, Inc. |
| Tabol | General Electric Information Services Co. |
| Xsim | Chase Econometrics/Interactive Data Corp. |

Figure 1

Source: Real Decisions Corp.

four other business problems: new product planning, cash-flow analysis, long-range planning and a sales-driven model. Some of the decision support systems also provided results for three optional prob-

lems addressing econometrics, capital projects funding and a large-scale model.

According to RDC, the benchmark problems were designed to reveal the flavor of

(Continued on Page 42)

Problems Used In RDC Benchmark

STAMFORD, Conn. — The benchmark test against which the 25 decision-support systems included in Real Decisions Corp.'s *Financial Modeling Decisions* report were tested included five problems:

- **New Product Planning.** Marketing research is evaluating the profitability of a new product over the next four years. Use of "what if" analysis and ranged sensitivity are featured, with both selected and complete printout of the model.

- **Cash-Flow Analysis.** This problem shows the preparation of a cash forecast based on a financial model and examination of the effects of various policy alternatives on cash requirements. It illustrates how different systems handle rather complex

(Continued on Page 42)

DOS/VS(E) Users Get Vsam Aid

BOSTON — Corodale, Inc. has announced two software products designed to help IBM DOS/VS(E) users to tune and monitor Vsam files.

Vsam/Calc is said to accept user input describing the characteristics of an existing or proposed Vsam file and produces reports that provide tuning information for the file. Vsam/List selectively lists the contents of Vsam Master and User catalogs in a number of formats, the vendor said.

Vsam/Calc reportedly assists the user in optimizing parameter specifications for Vsam files. The user provides file characteristics such as record size and numbers, key lengths, direct-access storage device-types and operating environment.

Vsam/Calc then calculates such factors as physical record size, control-interval (CI) size, index CI size and buffer space re-

quirements.

Vsam/List generates reports intended to provide a picture of the Vsam files and volumes in the user's installation. These include a standard report summarizing files, a file report and a volume report. The vendor said Vsam/List is an alternative to IBM's Access Method Services Listcat function.

Both Vsam/Calc and Vsam/List run on IBM and plug-compatible mainframes under DOS/VS(E) with a minimum partition size of 128K bytes. They are available immediately. The permanent license fees are \$1,000 for Vsam/Calc and \$1,500 for Vsam/List. The products also are available on a one-year lease basis for \$80 and \$120/mo, respectively.

Corodale is headquartered at 211 Congress St., Boston, Mass. 02110.

Abend-AID, an OS and DOS Operating System Enhancement, transfers the manual, error-prone task of analyzing program abends from the programmer to the computer. Abend-AID tells what happened, where and why it happened in brief English text that eliminates the need for hexadecimal calculations. Abend-AID is language independent, and works for old and new programs in a test or production environment.

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TSX-Plus Upgrade Bows

VAX/VMS Gets Relational Data Base Features

NASHVILLE, Tenn. — S&H Computer Systems, Inc. has introduced the Integrated Data Analysis System (Indas), a data analysis software package for Digital Equipment Corp.'s VAX/VMS systems.

In addition, the firm has unveiled Version 3.0 of TSX-Plus, its time-sharing operating system for DEC PDP-11 computers with memory management. TSX-Plus is said to provide the functionality of DEC's RT-11 operating system to multiple users on a time-sharing basis.

Indas reportedly provides data base facilities, such as the ability to sort, merge, update and join data bases; a programming language; a matrix ma-

nipulation language; and statistical analysis procedures including the general linear model.

According to the vendor, Indas features relational data base capabilities. The MERGE statement is said to implement a relational join operator, linking data from several data sets by a common key.

The enhanced version of TSX-Plus reportedly will take advantage of 22 bit addressing now available on the Q-bus, supporting up to 4M bytes of memory on the DEC PDP-11/23 Plus. Another new feature is the ability to specify the maximum amount of memory TSX-Plus will use. In addition, the updated version allows ap-

proximately 8K- to 9K bytes of additional space for device handlers.

The initial license fee for Indas for commercial users is \$5,000 for the PDP-11/780 (renewal fee is \$2,500), \$4,500 for the PDP-11/750 (\$2,250 renewal) and \$4,000 for the PDP-11/730 (\$2,000 renewal). For academic users, the initial fees are \$3,000 for

the 11-780 (\$1,500 renewal), \$2,500 for the 11/750 (\$1,250 renewal) and \$2,000 for the 11-730 (\$1,000 renewal).

The vendor is planning to deliver the first Indas systems early in 1983. The price for TSX-Plus version 3.0 is \$2,000. The vendor is located at 1027 17th Ave. S., Nashville, Tenn. 37212.

Study Covers DSS Capabilities

(Continued from Page 41)

each software package in terms of user friendliness and suitability for specific purposes. For example, the new product-planning problem emphasizes "what-if" capabilities and

sensitivity analysis, the cash-flow problem demonstrates how complex calculations and backward iterations are handled, the long-range plan features reporting capabilities and the sales-driven model contains simultaneous equations as an integral part of the problem solution.

The report also includes detailed information on each product, describing its capabilities in modeling, "what-if" analysis, data handling, reporting and graphics. Also presented in the study are facts about the authors who supply the software packages. For benchmarks run on a time-sharing service, the CPU costs for each benchmark run are reported and the time-sharing service price schedule and other facilities are also reviewed.

The 900-page report costs \$995 and purchasers will receive updates and additions until the next edition is published. For buyers interested in specific systems, minireports on packages selected from the full report are available, starting at \$250 for a two-system report and proceeding in increments of \$100 per system.

Real Decisions Corp. is located at 123 High Ridge Road, Stamford, Conn. 06905.

RDC Benchmark Examined

(Continued from Page 41)

computational requirements and how backward iterations are performed.

- **Long-Range Plan.** This problem involves the need to convert an existing model from one system to another. Each vendor was asked to duplicate a complete copy of the code and reports generated by the existing model.

- **"Sales-Driven" Financial Model.** This problem requires building a pro forma model based on a set of sales projections and a description of the applicable income statement and balance sheet relationships. One of the key tasks performed was the need to solve the model with simultaneous equations to reflect the interdependency of debt, interest expense and net profit.

- **Short-Term Model.** This requires the analyst to prepare a one-year forecast, by month, for four companies. It involves intracorporate calculations including currency conversion, allocation of headquarters costs and partial-ownership computation. It requires two levels of consolidations (divisional and corporate), model updating with "actual" data, preparation of percentage-change variance and cross-sectional reports.

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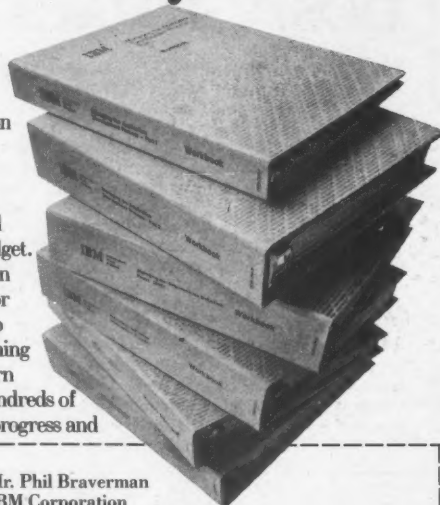
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Tone Releases ISP Enhancement For VS/1 to MVS Conversions

ANAHEIM, Calif. — Tone Software Corp. has announced Release 3.0 of its Intersystem Spool Processor (ISP), a software package designed to aid IBM users converting from the VS/1 to MVS operating systems.

Prior releases of ISP were designed to support multiple processors running the VS/1 operating systems and sharing direct-access storage devices to transfer spooled I/O data sets among several processors. Release 3.0 expands this support by allowing

both VS/1 and MVS systems to participate in the ISP environment. The addition of MVS also gives the user more flexibility in handling spooled data, the vendor said. This, the vendor claims, aids in a VS/1 to MVS conversion.

The package reportedly supports up to nine processors and costs \$6,500 for a perpetual license fee for a single processor. The vendor is located at 1735 Brookhurst, Anaheim, Calif. 92804.

System/34 Users Get Price Cuts On Control, Documentation Aids

LANSING, Mich. — Davidson Software Systems has announced \$200 price reductions for its System/34 line of management control and documentation aids.

Reduced to \$100 from \$300 are the following: History File Analysis, which calculates elapsed times and computes charges; Procedure/File Label Cross Reference, which provides alphabetical program-file-procedure and cross-reference reports; Spool Scan Utility, which displays

reports from a spool file; and the Procedure Explorer Utility and the Menu Documentation System.

Reduced to \$300 from \$500 is the Source/Procedure Control System, a utility that monitors and accesses System/34 libraries and tracks and prints management reports for all changes to programs.

The products are available from Davidson, which can be reached through P.O. Box 21002, Lansing, Mich. 48909.

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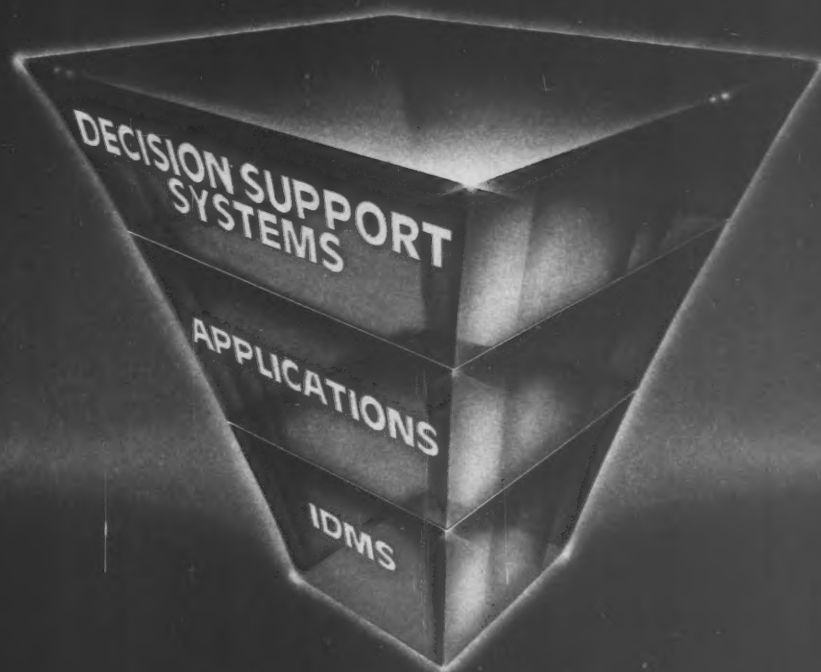
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Cullinane software works with all IBM 360, 370, 30XX and 43XX computers — or plug compatible equivalent.

DOS/VS(E) Alternative Supports IBM 3375, 3380

SAN FRANCISCO — The latest release of Software Pursuits, Inc.'s DOS/MVT/VS(E) operating system for IBM and plug-compatible mainframes reportedly includes support for IBM 3375 and 3380 disk devices.

Release 8.5 of MVT/VS(E), as it is commonly called, enables 3375 and 3380 devices to be used for libraries, system residences, spool queues, job accounting, Vsam, sequential and work files. In addition, these devices reportedly are supported for use by Isam through MVT/VS(E)'s logic modules.

MVT/VS(E) is described by the vendor as an alternative to IBM's DOS/VS(E) operating system for IBM 360, 370, 30 series and 4300 series and their plug-compatible equivalents.

The operating software is available on a monthly rental basis, ranging from \$600/mo for a 4331-type CPU to \$900/mo for a 3033-type CPU. Software Pursuits offers on-site conversion support, which includes approximately 10 days of operating system installation, interface

with other system software products, formal training classes and coverage during the first few days of live production. The one-time charge for this service is typically \$3,500, the vendor said.

Further information can be obtained from Software Pursuits, Inc., Suite 800, 444 Market St., San Francisco, Calif. 94111.

For TSO Environment

IBM Users Get Text Editor Package

FALLS CHURCH, Va. — A general-purpose text editor and multiprompter said to operate interactively in the IBM TSO environment has been introduced by Tech Products, Inc.

TP/Extenz is intended for use on IBM 360, 370, 4300, 30 and 3080 series and equivalent systems and features both single-line and full-screen cursor-editing modes,

which provide the user with greater ease in writing, debugging and maintaining programs, the vendor claimed.

The package allows users to specify multiple commands in one input line, reducing the interaction with the host system, while supporting all terminals, the company claimed.

Other features include

split-screen facility supporting edit, browse and utility modes; enhanced display support services; a pattern-matching capability; and multiprompting mode, which speeds program compilation, the vendor said.

TP/Extenz carries a one-time licensing fee of \$15,000 from Tech Products, 7700 Leesburg Pike, Falls Church, Va. 22043.

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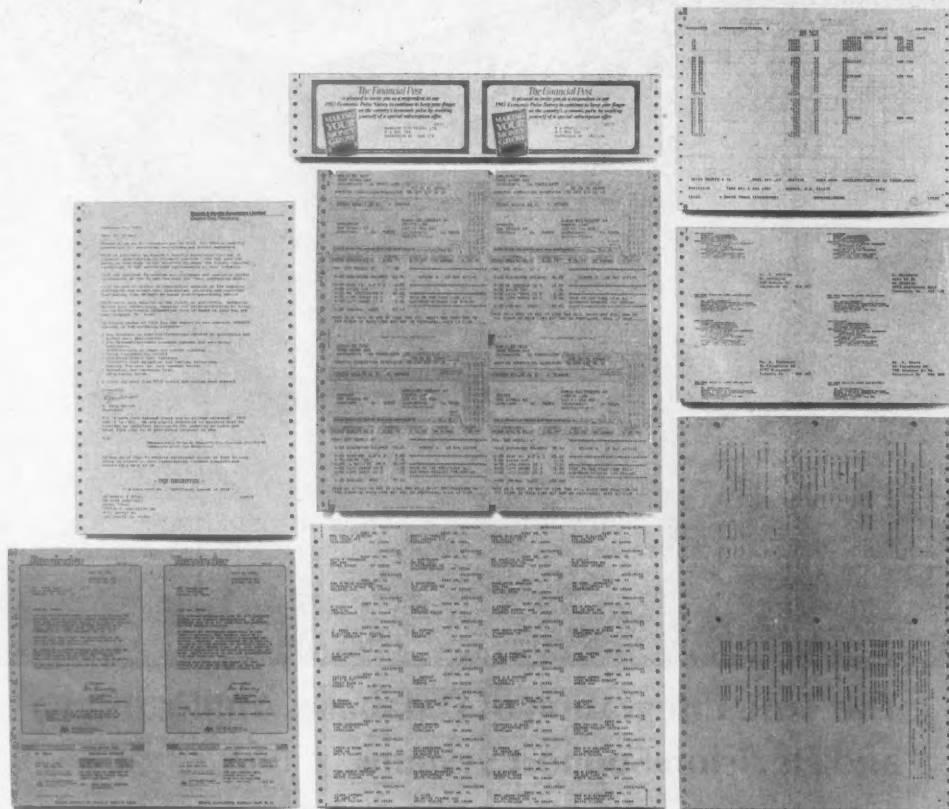
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If you need high volume and flexibility, you should know that the Datagraphix 9800 laser printer prints up to 21,000 LPM. It also accepts the widest variety of paper form sizes of any non-impact printer, with form widths of 6.5" to 16" and a length range of 3.5" to 14". And all 9800 printers feature perf-to-perf printing on paper weights of 16 to 110 pounds, depending on paper type.

The 9800 series is an entirely new generation of non-impact, high speed laser printers—with more functions, features, and reliability. It offers up to 34 standard character sets, with a font editor that helps you create a nearly unlimited variety of fonts, logos or signatures of your own design. The 9800 series comes in a variety of on-line, off-line, or on-line/off-line configurations compatible with a broad selection of CPUs. Off-line models offer user-oriented menu-driven software, hard copy log, 6250 BPI tape drives with ping ponging capability and more. On-line models offer full IBM 3800 compatibility, in addition to the advantages of Datagraphix' advanced engineering.



DEC Unveils Health Surveillance System

MAYNARD, Mass. — An occupational health surveillance system designed to help maintain safe work environments and improve employee health and productivity in medium-size to large companies has been announced by Digital Equipment Corp.

Dechealth collects, integrates and cross-references a variety of data related to worker health and safety and

can track patterns of illness and injury, correlate health problems with environmental factors in the work place and produce both comprehensive and ad hoc reports to satisfy external and internal requirements, the company claimed.

The system runs on DEC's VAX-11/780 and 11/750 minicomputers and is fully supported by its service organization, the vendor said.

The package is an interactive system designed for personnel without previous computer experience and allows users to choose tasks from a menu and enter data by filling in spaces on displayed forms.

The package consists of six data collection and reporting modules — employee, work area, agent, health services, industrial hygiene and reporting — that correspond to

the basic functions of an occupational health program, the vendor said.

With deliveries scheduled to begin in March, Dechealth

is priced at \$99,500 including installation and a 90-day warranty from DEC at 146 Main St., Maynard, Mass. 01754.

CICS Users Get Security Aid

HASBROUCK HEIGHTS, N.J. — Oxford Software Corp. has announced an on-line security product called CICS On-Line Security System (Coss), which is intend-

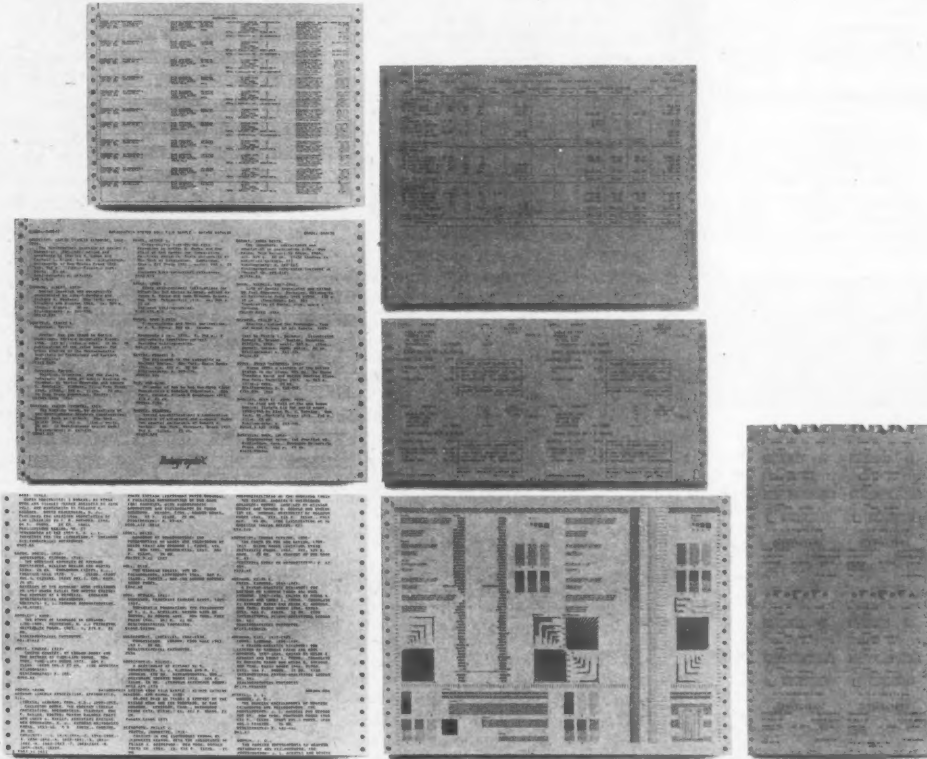
ed for users of IBM's CICS on IBM and plug-compatible mainframes running under DOS/VS(E) or OS/VS1/MVS.

Coss is an interactive, non-procedural security package designed to provide protection for the entire CICS environment, in addition to user-defined events and resources such as Oxford's own User Files On-Line (UFO) CICS applications development system, the vendor said.

The Coss software is said to protect all resources known and available to CICS, including all UFO resources down to the field level, plus any user-defined resources or events. Installation of the product reportedly requires no modifications to CICS or the operating system. Coss works in parallel with native CICS security or other security packages, the vendor noted.

Coss is an on-line package and operates in real-time. It includes menus and fill-in-the-blank specification screens. It is said to prevent unauthorized access to data by instituting eight classes of operator restrictions and multilevel password security.

The OS version of Coss is priced at \$20,000, plus an additional 15% of the cost for maintenance. The DOS version costs \$14,000, plus 12% additional for maintenance, the vendor said from 174 Boulevard, Hasbrouck Heights, N.J. 07604.



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Additional Data Bases Out For Dialog Retrieval System

PALO ALTO, Calif. — Dialog Information Services, Inc. has announced the addition of nine data bases to its on-line information retrieval system. The nine additions include the following:

- **Telegen** — contains over 53,000 records about biotechnology and genetic engineering from 1973 to the present.
- **Books in Print** — contains 650,000 records listing the entire current U.S. book-publishing inventory.
- **Laborlaw** — includes 175,000 summaries of decisions related to labor relations, fair employment, wages and hours and occupational safety and health.
- **Paperchem** — includes 160,000 records on topics related to the paper industry.
- **Electronic Yellow Pages/Construction Directory** — contains

880,000 records covering contractors and construction agencies.

- **Waternet** — contains 5,000 records from the file of the American Water Works Association.
 - **BLS Employment, Hours and Earnings** — provides data gathered from the files of the U.S. Bureau of Labor statistics.
 - **Chemsis 82+** — Cites five million chemical substances included in the 11th collective index period of *CA Search*.
 - **Chemzero** — Contains other chemical substance records for which there are no citations in *CA Search*.
- The price for searching the new data bases ranges from \$45 to \$130/connect hour, with off-line printing priced at 15 cents to 70 cents from Dialog at 3460 Hillview Ave., Palo Alto, Calif. 94304.

Unit Prevents Security Violation On Intel's System 2000 DBMS

AUSTIN, Texas — Acts Corp. has announced security software designed for use with the Intel Corp. System 2000 data base management system (DBMS).

The system, called the Access Control Facility for S2K (ACFS2K), reportedly prevents unauthorized data base access for both multiuser and single-user versions of the DBMS running under IBM's OS and VM/CMS operating systems.

The company reported that the system prevents unauthorized access to

data by defining a security profile for each data base. The profiles contain one or more authorized user profiles, which specify each user's operator identification and optionally include the terminals and/or transaction programs from which user access is allowed.

When a security violation occurs, ACFS2K alerts the console operator or designated time-sharing operator. The package comes with a comprehensive recording facility that provides a detailed security audit trail.

ACFS2K complements security controls for other security systems such as IBM's Resource Access Control Facility, the Cambridge System Group's ACF2 and Boole & Babbage, Inc.'s Secure/CICS, a spokesman said.

The system costs \$4,500 for a permanent CPU license from 11910 Gate Way, Austin, Texas 78759.

'Fin-Pac/38' Fits System/38

CHICAGO — Arthur Andersen and Co. has introduced the Fin-Pac/38 general ledger and responsibility reporting system, developed specifically for use with RPG-III and said to utilize interactive and data base facilities while providing a range of accounting and reporting functions.

The package, for use with the IBM System/38, has a financial user orientation, flexible reporting features and controls and audit trails and can be used to meet a variety of financial reporting requirements without programming changes, the company claimed.

The system can generate balance sheets and income and expense statements for multiple legal entities and reporting structures, including company groups, divisions, profit centers and combined companies, the vendor said. It also provides support for the consolidation of company operations. Designed to meet the needs of international businessmen, the package provides currency conversion capabilities, international date formats, report heading and screen literal translation and the ability to maintain and report account balances in all currencies, the vendor said.

Fin-Pac/38 is priced at \$5,000 plus installation from Arthur Andersen and Co., 33 W. Monroe St., Chicago, Ill. 60603.

VAX-11 Version Of 'RCS-7' Out

HOUSTON — A Digital Equipment Corp. VAX-11 version of RCS-7, a real-time supervisory control and data acquisition product, has been announced by SGM, Inc.

RCS-7 also runs on the DEC PDP-11 and Modcomp Systems, Inc. Classic family of computers using color graphics CRT terminal displays, the company said.

Changes to the data base and displays can be made to the system while it remains on-line. It was designed to be generic, system-independent and user-friendly, the vendor claimed.

RCS-7 supports applications in oil and gas, electric utilities, environmental monitoring, security, transportation, waste and water management and automation, the company said.

RCS-7 is priced from \$40,000 to \$75,000, depending on the user's VAX-11 system. The product is available from SGM, 8830 Interchange Drive, Houston, Texas 77054.

Menu-Driven Graphics Package Designed for Use by Non-DPers

TORONTO — A menu-driven graphics package designed for use by non-DPers has been announced by Dataplotting Services, Inc.

D-Pict/B allows users to create complex business graphs through simple, interactive question-and-answer methods, allowing users to recall charts and graphs created and to add to them with new data, the company said.

Package Detects Duplicate Items

LOMBARD, Ill. — A new software product said to identify duplicate records on mailing lists has been introduced here by List Processing Co. for users of IBM and plug-compatible mainframes.

Dupdetective reportedly helps marketers refine their selling strategy by eliminating redundant entries and noting the number of various address types on each mailing list such as rural route, post office box or conventional street addresses.

Dupdetective also produces profiles of each list by compiling statistics during and after list processing. A special feature of this product is its ability to standardize address records, such as street names or abbreviations.

Distributed on a magnetic tape file, Dupdetective reportedly enables mailers to process multiple lists (up to 100) on their own schedules. It consists of four stand-alone IBM assembler programs and one IBM assembler subroutine in object code format. It costs \$20,000 from the vendor at 555 Waters Edge, Lombard, Ill. 60148.

'Rabbit-4' Provides RSTS/E Security

ATLANTA — Intrusion prevention software designed for RSTS/E Version 7.0 and above has been announced by Raxco, Inc.

Rabbit-4 was designed to provide maximum RSTS/E system security by extending password requirements to terminal validation by dynamic port selection while exercising extensive control over keyboard system access.

The system will also limit access to predetermined time-of-day and day-of-week specifications, while allowing a menu system to be utilized providing user control via customized system commands, the vendor claimed.

The system also provides optional day-file logging of each command issued from specified terminals including date, time and job, while providing a complete security history file should security problems arise.

The package is written entirely in Digital Equipment Corp.'s PDP-11 Macro assembly language utilizing reentrant code and requires one 6K-byte copy for up to 63 users, the vendor said.

Rabbit-4 System Intrusion Prevention is priced at \$3,995 or \$200/mo rental from Raxco, located at Suite 200, 6520 Powers Way, Atlanta, Ga. 30339.

The company also announced D-Pict/VGL, a set of device-independent graphics subroutines for use by applications programmers. The package is compatible with, but extended beyond, the Siggraph Core Standard, and it features a computer graphics development tool for a variety of applications, the vendor said.

Both packages can be purchased or used via Dataplotting Services' Digital Equipment Corp. VAX-11 time-sharing system, with access over local dial-up.

The D-Pict/B and D-Pict/VGL packages are priced at \$8,000 each from Dataplotting Services, 225 Duncan Mill Road, Toronto, Ont., Canada M3B 3K9.

Vsam Utility Out for CICS

DENVER — An interactive Vsam problem-solver utility program designed for use on any large-scale IBM computer running in a CICS environment has been introduced by MB and Associates.

VMSU allows users interactively to display, add, change and delete records on any on-line Vsam file, while allowing records to be accessed singly or in groups, by full or generic key, the vendor said. The utility also enables users to reduce the need for writing one-time, Vsam "fix-it" programs and allows programmers to build and use Vsam test files on-line.

VMSU licenses for \$3,900 and is available from MB and Associates, 97 S. Nome St., Aurora, Colo. 80012.

'Cams Online' Monitors CICS

BROOKFIELD, Conn. — An on-line IBM CICS accounting and monitoring system designed to aid in CICS fine-tuning, trouble-shooting and capacity planning has been announced by Universal Software, Inc.

Cams Online allows various CICS tables and a variety of conditions and statistics to be displayed on any CICS terminal, while providing hard-copy reports showing current and past activity, the vendor said. The package operates on IBM and plug-compatible DOS/VS and DOS/VSE with any CICS version from 1.4 up, the company claimed.

Cams Online leases for \$50/mo from Universal Software, Brookfield Office Park, Brookfield, Conn. 06804.

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Micro Notes

Intellimac, Inc. has announced a multiuser programming support environment for the implementation of the Telesoft, Inc. Ada compiler on Intellimac's Multibus IN/7000 series microprocessor-based system.

The Intellimac Multi-System Executive (IN/MSX) enables up to eight users to perform independent programming in either Ada, Pascal or assembly language, or to mix any combination of the languages concurrent-

ly. IN/MSX also allows multiuser development of multiuser applications that can run on a turnkey system, a spokesman said.

IN/MSX supports up to 1.25M bytes of main memory in the single CPU configuration, the company reported. IN/MSX automatically manages physical machine resources, including segmented memory management, clock interrupts and processors, Winchester and floppy disk controllers and serial I/O ports.

A lockout facility reportedly ensures each user exclusive access to system resources. A virtual monitor allows programmers to run a variety of memory diagnostics before programming begins.

IN/MSX also provides automatic scheduling and interrupts handling capabilities, the spokesman said. A multiuser kernel recovers from machine exceptions to prevent any user from crashing the system via a malfunction in a single program, the vendor said. A virtual monitor mode allows the system control of master user to display the status of other users and queues, stop or continue any user and perform system reloads.

A printer and serial I/O spooler/despooler automatically stores material that is to be serially dumped in a buffering disk file until the physical I/O device is available.

IN/MSX costs \$1,000, plus the Telesoft-Ada PSE license fee, from Intellimac at 6001 Montrose Road, Rockville, Md. 20852.

Computer Software Management and Information Center has announced **Softcost**, a soft-

ware cost estimation model that operates on Zilog, Inc. Z80-based systems running under Digital Research, Inc.'s CP/M.

The package provides a consistent automated resource and schedule model for software development and maintenance, the company reported. It produces mean and variance estimates of software size, implementation productivity, recommended staff level, probable duration, amount of computer resources required and amount and cost of software. Soft-cost source code is available for \$300 from 112 Barrow Hall, University of Georgia, Athens, Ga. 30602.

Bytek has announced a Unix version of **Cogen**, a Ryan-McFarland, Inc. Cobol program generator that runs on CP/M micros for programming standard business applications, including file maintenance, inquiries and reports. Programs are developed through a series of interactions with menus and data entry screens, the company reported. Programmers respond to Cogen prompts, paint the de-

(Continued on Page 52)

'Executec Software Bus' Targets Personal Business Computer Users

CHICAGO — Although most of the software announcements at Software/Expo here were targeted at mainframe or minicomputer environments, there was some action in the micro arena.

Executec Corp. announced a new architecture that acts as a standard interface between the user and a variety of application programs running on personal business computers. The Executec Software Bus reportedly ensures standardized sign-ons, screen formats, procedures, commands, security and Help features between all applications run in the bus environment.

The Software Bus operates under a variety of operating systems, including Digital Research, Inc.'s CP/M, Microsoft, Inc.'s MS-DOS and IBM's PC-DOS. It costs \$450 and includes Executec's Integrated Text Processing and Personal Records Management applications.

Executec also unveiled The Profes-

sional Data Processor series of personal computer software, which consists of documentation generation, budget and project planning, report and memo writing, personal records management and distributed processing.

Executec's communications systems reportedly allow the personal computer to communicate either as an IBM 3270 interactive terminal or as an IBM 3780 remote job entry device, permitting interactive adding, updating or deleting of selected records from the host.

Promptdoc Manual Master is another application included in the series. It acts as an aid to the software developer and documentation writer in the structure, organization and content of written documentation.

The price of the Professional Data Processor series is \$450 to \$4,000, depending upon modules selected. Executec is based at 12200 Park Central Drive, Dallas, Texas 75251.

VMBACKUPSM

USER RESULTS: "My backups dropped from 32 hours per week to 4 hours."

VMBACKUP will:

- save personnel time by offering end user file restore capability
- save time & tapes by dumping only data that has changed yielding up to 90% savings in time and tape
- save disk space with Optional end user archiving system.

VMBACKUP Highlights:

- Keeps VM available continuously
- No modifications to install
- Cataloging of minidisks, files, and tapes
- Incremental backup
- End user restore option
- Support for CMS & non-CMS minidisks
- Packing, encryption & chargeback
- Standard label tapes

VMTAPESM

USER RESULTS: "In only one hour VMTAPE changed my tape situation from total chaos to total control."

VMTAPE will:

- manage tape volumes & tape drives
- save data from being clobbered inadvertently by offering standard label tape support
- save operator time by transferring decisions to VMTAPE
- interface optionally to OS/VS tape system.

VMTAPE Highlights:

- No modifications to install
- Interface to MVS or VS1 tape manager
- Services multiple mounts concurrently
- Supports both interactive and CMS BATCH users
- Comprehensive data security facilities
- Extensive expiration date support

VM

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- ☐ Send information on VMBACKUP.
☐ Send information on VMTAPE for my VM-only machine.

- ☐ Send information on VMTAPE with OS/VS Interface. My OS/VS tape manager is _____

Name _____

Title _____

Company _____

Address _____

City, State _____ Zip _____

CPU _____

Phone _____

VAXSM users have had a difficult choice to make: whether to stay DEC-compatible with a VMSSM environment, or sacrifice those advantages to switch to the more widespread UNIXSM operating system.

VMSSM is a good environment. But rapid expansion through dozens of manufacturers has now made the UNIX system the first truly standard OS in the industry. In the years ahead, the portability of software will depend more and more on its compatibility with the UNIX system. Now...

UNIXSM systems and VMS needn't compete as exclusive alternatives; you can have both at once! With our VAX UNITYSM under VMS, you can run UNIX software development and applications without change and concurrently with all your present VMS software. VAX UNITY under VMS is derived from Bell Laboratories UNIX System III. It comes with full support for one year at prices starting from \$9,995, including an AT&T UNIX System III license. To find out how we can put your VAX running VMS and the UNIX operating system together, call or write:

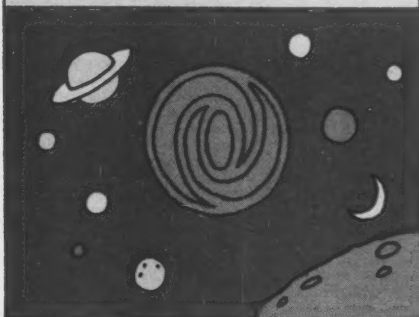
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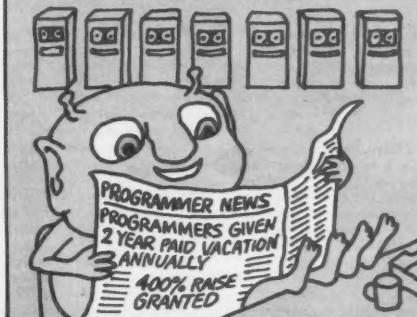
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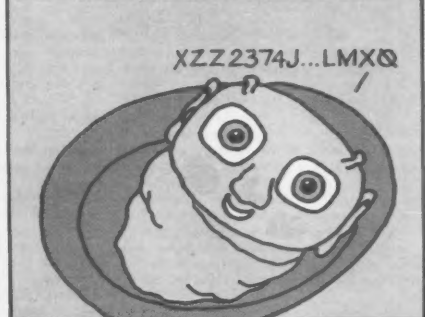
SOMEWHERE DEEP IN SPACE
IS THE PLANET OXFORD...



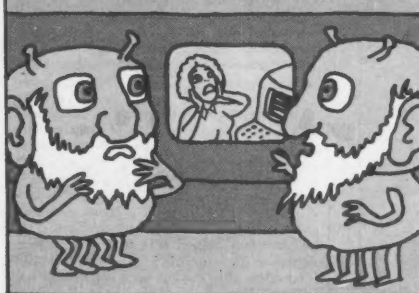
SO ADVANCED THAT THEIR
COMPUTERS ACTUALLY WORK.



AND WHERE THE FIRST THING
A NEW BABY SPEAKS IS COBOL.



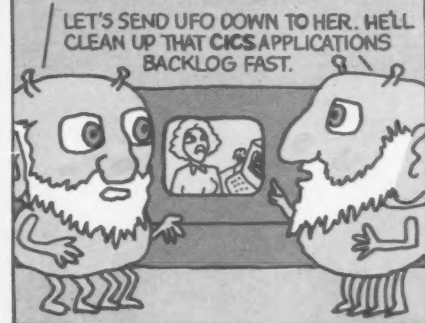
AS WE JOIN OUR STORY, THE ELDERS
OF OXFORD ARE OBSERVING
A DILEMMA ON THE PLANET EARTH.



I DON'T KNOW HOW I'LL EVER GET
THIS CICS APPLICATION WRITTEN;
WE ALREADY HAVE A 312 YEAR
PROGRAMMING BACKLOG...
AND I HAVE A DATE TONIGHT.



CAN'T WE HELP THAT EARTHLING?
SHE LOOKS LIKE A SWEET KID.



GOOD MORNING, MISS. I'M UFO FROM THE
PLANET OXFORD, AND I'LL DO
YOUR CICS PROGRAMMING
IN A FRACTION OF THE
TIME, EVEN THOUGH
YOU DON'T HAVE
ENOUGH CICS
EXPERTS ON
STAFF.




OOH-UFO...HOW CAN I EVER
REPAY YOU?



I'LL THINK OF
SOMETHING...HEH HEH.

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WITH YOUR CICS
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Our software is out of this world**

 OXFORD SOFTWARE CORPORATION
174 BOULEVARD/HASBROUCK HEIGHTS, NJ 07604/201 268-4515

Micro Notes

(Continued from Page 50)

sired screen displays and report formats and then instruct the package to produce the application code. Cogen is available for under \$1,000 from 1714 Solono Ave., Berkeley, Calif.

The Software Works has announced a 79 standard version of the Forth programming language for Sanyo Business Systems Corp. MBC-1000, -2000 and -3000 computers. **Software Works Forth Level I** uses CP/M for file handling and disk I/O and can share data files and disk storage with other languages and application programs. The basic system costs \$95, a company spokesman said from Suite 210, 1032 Elwell Court, Palo Alto, Calif. 94303.

Ampersand Corp. is offering a family of 97 banking programs designed for the IBM Personal Computer. The **Branchbanker** programs are said to support banking activities in the areas of micro-host communications, the capture of bank data previously requiring paper forms and the marketing of retail financial services

including individual retirement accounts, certificates of deposit and loans. Individual modules are available starting at \$250 with master modules containing up to 50 programs for \$1,250 from Ampersand Corp., P.O. Box M-84, York, Pa. 17405.

Digital Marketing Corp. has announced the release of **Compress**, a data compression program for Digital Research, Inc.'s CP/M files said to reduce archival storage requirements up to 40%. **Compress** can be used wherever there is a need to reduce storage requirements or connect time, both for Ascii and non-Ascii files, the vendor said. Cost savings are further realized if files are transferred via communications channels, such as modem transfers, by reducing transmission time and costs, the company claimed. **Compress** is priced at \$59.95 from Digital Marketing Corp., 2670 Cherry Lane, Walnut Creek, Calif. 94596.

North America Mica, Inc. has released Version 3.0 of its Critical Path Project Manage-

ment System, **PMS-II**, for microcomputers. In addition to a rewritten manual, the system now produces a three-part earned value analysis that shows the value of work accomplished as a percentage of the budgeted amounts for each activity in both tabular and graphics forms, the vendor claimed. Additionally, a job cost field to the activity record has been included so that the project can be integrated directly to the user's job costing system, the company claimed. The **PMS-II** system is priced at \$1,295 from North America Mica, Inc., 11772 Sorrento Valley Road, San Diego, Calif. 92121.

Comsen, Inc. has introduced a general-purpose sort package for IBM Personal Computers. **Comsort** reportedly will sort data files into either address-out or record-out format. The package costs \$80 from 20-A Erford Road, Lemoyne, Pa. 17043.

Codata Systems Corp. has announced an **Xbasic-Plus-compatible interpreter** for its Unisis version of Bell Laboratories Unix oper-

ating system. Unisis is available for systems based on the Motorola, Inc. 68000 microprocessor. The **Xbasic-Plus** option can run any program written in Digital Equipment Corp.'s **Xbasic-Plus** language. The package costs \$900, the vendor said from 285 N. Wolfe Road, Sunnyvale, Calif. 94086.

Condor Computer Corp. has announced a relational data base package for Hewlett-Packard Co. HP 125 processors. The package is supported through the HP Plus program. The Condor package features English language interaction for creating data bases. The package supports up to 32,767 entries, and each entry can support up to 127 fields per entry, the vendor said. All HP configurations are supported by the package.

The Condor package comes in two forms. The entry-level **Series 20-1** allows users to create data bases in a few minutes and report information soon thereafter. **Series 20-2** is for more advanced uses, such as multiple files, the vendor said. Condor 20-1 costs \$295 and Condor 20-2 is \$595. An upgrade from the 20-1 version to the 20-2 version costs \$350, the vendor said. The package can be purchased through HP, the inquiries manager said from 1820 Embarcadero Road, Palo Alto, Calif. 94303.

Data Management Systems has announced **CCDS**, a relational data base management package for the Radio Shack TRS-80 Model 16 and processors based on the Motorola, Inc. 68000 microprocessor. The package operates using menus and an English subset query language. It is implemented in 68000 code and supports single-access sequential, indexed sequential and hashed files, the vendor said. The package costs \$595, the company said from Suite 101C, El Camino Real, Encinitas, Calif. 92024.


Regional Database, Inc. has introduced a relational data base management system for 16-bit microcomputers running on the Bell Laboratories Unix operating system. **Informix 2.0** is said to allow users to add, delete or update records interactively on a formatted screen. Also available with the package is **RDS ACE Report Writer**, which allows users to produce reports with English-like commands. Single copies of Informix with the report writer are \$5,000, available from the vendor at Suite 503, 1208 Apollo Way, Sunnyvale, Calif. 94086.

Digital Marketing Corp. has introduced a package for recovering erased files, protecting, deleting and renaming files, as well as forging multiple user links to a single file running under Digital Research, Inc.'s operating system, CP/M. **Filefix** is said to be menu-driven and will allow scrolling of text files one screen at a time. **Filefix** is available for \$100. Digital Marketing has also introduced **The Micro Link**, a communications program for the IBM Personal Computer. This package allows communication with other microcomputers, information services and terminals. It sells for \$89 from the vendor at 2670 Cherry Lane, Walnut Creek, Calif. 94596.

Micro Decisionware has introduced the **Seed** data base management system for the IBM Personal Computer. It can be used for the development of business, scientific or other applications and supports a query language and a report writer. It is available for \$995 from the vendor at 4890 Riverbend Road, Boulder, Colo. 80301.

Computer Dimensions, Inc. has introduced a software package said to allow users of microcomputers running the Digital Research, Inc. operating system, CP/M, to build user-defined tables of information. **ScanMaster** employs scanning logic that provides for multiple-level scanning in one data pass to pinpoint data records and satisfy multiple search parameters, a vendor spokesman said. The package is available for between \$750 and \$2,750 from the vendor through P.O. Drawer 3990, 203 W. Elm St., Florence, S.C. 29502.

Martec International Electronics Corp. has introduced a binary synchronous communications program for its Japanese-manufactured Ibox 7301 and related systems. **Synch** emulates an IBM remote job entry station allowing the Ibox to exchange messages with a remote processor using the binary synchronous communications protocol, a vendor spokesman said. It is available for \$500 from the vendor at 20 William St., Wellesley, Mass. 02181.



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Cost-Efficient Connections

Value-Added Nets Offer Economic Gains

By Joseph Rinde
Special to CW

Value-added networks provide an economical means for interconnecting geographically separated data devices. The most common example is a terminal-to-host computer connection. Other examples are computer-to-computer and terminal-to-terminal connections. To add confusion, the existence of personal computers and their use as intelligent terminals make all the connections described above the same. However, for illustrative purposes, the historical terms terminal and computer will be used here.

The availability of access to a value-added network is very much like the availability of access to a telephone network. This presents advantages such

as local networks. It is possible to establish a connection to any other subscriber by knowing that subscriber's address (telephone number).

In the telephone network, the party billed is based on the physical device used to originate the call. Control of physical access to the device is the only form of security possible. Thus, billing is not based on the caller, but on the device from which the call is made. The exceptions to this are collect and credit card calls.

The use of a credit card is desirable because the caller is identified. The tariff used is based on the origin and destination devices, but the bill is sent to the caller, independently of the two locations. This should be an integral part of a value-added network's service.

When a call is placed on a value-added network from a computer or a terminal that is connected to the network by a leased line, it is possible to bill based on the physical origin of the device. When the call is placed from a public dial port this is not possible. Indeed, even in the first case the call could have been placed by any user on the computer.

The Consultative Committee on International Telegraphy and Telephony (CCITT), an international standards body, has defined a Network User Identifier (NUI) for use with public dial ports for asynchronous terminals. The capability to identify the caller to a public dial port for synchronous (X.25 — a CCITT-defined protocol) terminals is being developed.

A proper NUI consists of two parts: a known part, which constitutes the billing name (credit card number) and a secret part that can be used to verify the identity of the caller (analogous to the personal identification number used with automated teller machines). The secret part should be user-selectable and user-changeable. It should not be hard to remember, so it is never written down, but it should not be easily guessed and should be changed periodically to ensure privacy.

Devices capable of initiating multiple connections from the

same port present a different problem. In the past, such devices were only host computers with dedicated network access. Thus the physical origin was known. This has been the case for past uses of X.25. However, terminals that use X.25 are now being built. One example is teletex terminals (CCITT's telex replacement), but can personal computers be far behind? Such devices may not be able to maintain dedicated connections economically to one or more value-added networks.

CCITT has not solved the problem of individually identifying each caller when multiple processes request calls from the same X.25 device. Since the network can already verify the caller's identity, the computer must recreate this ability. This would be a duplicate data base, with all the problems of a distributed data base. This is true since a user's identity (account name) may be different to the host computer than to the value-added network. The problems are compounded when we consider access controls.

Access Controls

In a value-added network, access can be controlled based on the caller's identity. The control can be done on the points of origin in the value-added network that are permitted as well

(Continued on Page 54)

Racal-Milgo Modem Out

NEW YORK — Racal-Milgo, Inc. introduced a high-performance modem here recently, which the company said improves network management by providing users with real-time data on modem and system performance.

Called Omnimode 48, the modem's standard features include 4,800 bit/sec operating speed, which can operate with CCITT international or domestic data network standards; full operating parameter controls; modem, line and interface status display; and worldwide built-in test features for local and remote modems including CCITT V.54 loops.

Racal-Milgo said the modem operator can select and adjust all operating parameters and speed selections from the equipment's front panel, and the product eliminates the use of internal hardware straps.

Options for the Omnimode 48

include a remote control modem (RMC) option and multiport option. The RMC option provides remote modem and port status, testing, configuration selection and adjusting, and speed and strapping control of all remote Omnimode modems on both point-to-point and multidrop lines from the front panel of the central Omnimode 48. A network failure alarm and a call feature are also part of the RMC, according to the company.

The multiport option is available in two-port and four-port operation and can be assigned a combination of data rates up to the total modem rate of 4,800 bit/sec, Racal-Milgo said.

The Omnimode 48 in a basic configuration is priced at \$3,600 and is available immediately. More information is available from Racal-Milgo, P.O. Box 520399, 8600 N.W. 41st St., Miami, Fla. 33152.

Unit Converts DEC LA-120

BURLINGTON, Mass. — Texprint, Inc. has introduced a module that is said to convert any Digital Equipment Corp. LA-120 printing terminal into a DEC VT-100-compatible character graphics plotter.

Decplot will allow the terminal to generate low-cost charts, graphs and diagrams on a normally text-only hard copy terminal.

The module also offers full operating compatibility for all DEC minicomputers and the DEC VT-125 and Retro-Graphics enhanced terminals, a vendor spokesman said. Installation time is said to be less than three minutes for the plug-in module.

Decplot is available for \$595 from Texprint, Inc., 8 Blanchard Road, Burlington, Mass. 01803.

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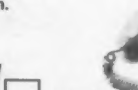
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Visionary 100 Modem Operates Independently

SAN FRANCISCO — A 300 bit/sec programmable, microprocessor-controlled modem said to operate completely independent of the host computer and capable of sending and receiving electronic mail while the computer is being used for other purposes has been announced by Visionary Electronics, Inc.

The Visionary 100 utilizes the RS-232 interface and is compatible with most business and personal comput-

ers, the vendor claimed.

The modem features its own internal real-time clock and calendar, on-board memory to store messages and lists of phone numbers and user-friendly communications software, the company said. It comes with 2K bytes of memory and is expandable to 24K bytes.

The Visionary 100 is priced at \$595. Visionary Electronics, Inc. is located at 141 Parker Ave., San Francisco, Calif. 94118.

Echo Canceler Option Released For Storage Technology's COM2

LOUISVILLE, Colo. — Storage Technology Corp. has introduced an optional echo canceling device for its COM2 voice concentrator/multiplexer system.

Echo, the audible reflection of a conversation, can distract both speakers during long-distance telephone conversations, the vendor claimed. Echo cancelers, integrated into each channel on a per circuit basis, measure the analog signal in one

direction of a conversation, creating a model of the expected returning echo, a Storage Technology spokesman claimed.

The COM2 system multiplexes a number of simultaneous telephone conversations onto about half the number of telephone lines, a spokesman said. The solid-state, microprocessor-controlled system consists of two units, one connected at each end of the telephone trunk

group to be multiplexed, according to a vendor spokesman.

The device is available for between \$58,000 and \$125,000, including installation. Storage Technology Corp. is located at 2270 S. 88th St., Louisville, Colo. 80027.

Nets Offer Lower Costs

(Continued from Page 53)
as on the destination points.

The two could be coupled where certain destinations are only accessible from specific origins. These kinds of restrictions form closed user groups.

Members of a closed user group can be assured that no one outside the community can possibly gain access to their destinations.

The lack of user identification in calls originating from X.25 host computers precludes this form of access control.

The CCITT has defined a closed user group capability that can be used in the X.25 environment. At call request time, the calling process specifies a closed user group number (between 0 and 99).

The operating system is again put in a position of administering which of its users may invoke particular closed user group numbers.

The value-added network's interface uses the closed user group number as an index to a table to get a 16 bit-internal code. At the destination value-added network interface, a search is made of a corresponding table.

If a match is found for the internal code, the index for its table position is passed to the destination computer as the closed user group number.

Joseph Rinde is manager of software research and development for Tymshare, Inc., Cupertino, Calif.

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Floppy Disk-Based Terminal Offers Data Collection

KENT, Wash. — A floppy disk-based data collection terminal oriented toward data polling from private branch exchange systems, data transfer from one computer system to another, local program storage or buffering for computer backup has been announced by Management Data Services (MDS).

The MDS data collector features dual floppy disk operation with capacity up to 1.6M bytes of usable storage, a company spokesman reported. The unit is said to trans-

mit data at speeds up to 9600 bit/sec in either Ascii or 8-bit binary codes while simultaneously collecting data on another disk.

The programmable data collector can be custom configured to the user's requirements, can reportedly act as a security backup to large data collection systems and can sit in a transparent mode and activate itself if the main system goes down.

Prices begin at \$2,100, the company reported from 23830 Pacific Highway S., Kent, Wash. 98032.

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Ties to RS-232/V.24 Equipment

Interface Monitor Adapter Out

ALEXANDRIA, Va. — Atlantic Research Corp. has introduced an interface monitor adapter that is said to adapt CCITT standards X.20/X.21, V.35, Electronic Indus-

tries Association's RS-449 and Bell Laboratories' 303 signals to the more common RS-232/V.24 test equipment.

The IFA-22 Universal Interface Monitor Adapter is said

to allow the passive non-loading of a circuit to be monitored. Physical connection of the various interfaces is accomplished with cables designed for the specific interface. I/O signals are buffered to meet the respective specifications, a vendor spokesman said.

The device is priced between \$425 and \$1,150 depending on the interface adapter cables required. Atlantic Research Corp. can be reached at 5390 Cherokee Ave., Alexandria, Va. 22314.

Limited Distance Modems Added to Avanti 1900 Line

NEWPORT, R.I. — Avanti Communications Corp. has announced two high-speed, limited distance modems that add to the company's line of Avanti 1900 local-area network data distributors.

The 1935 and 1949 series modems offer either an RS-449/422 or V.35 digital interface and operate in a

point-to-point or multipoint mode over unloaded twisted cable at distances of up to two miles, the company reported. The units operate at 56K or 64K byte/sec in an unrestricted data format.

The modems are priced at \$975 from Aquidneck Industrial Park, Newport, R.I. 02840.

DDU Serves As Modem

WALLINGFORD, Conn. — A digital distribution unit (DDU) has been introduced by Dataproducts New England, Inc. to serve as a limited-distance modem.

The DDU-1 is said to be compatible with RS-232C and military-standard-188C interfaces. The unit reportedly provides point-to-point and multipoint data communications transmission over balanced, multipair cables at selectable synchronous rates up to 19.2K bit/sec and asynchronous rates up to 2,400 bit/sec.

The DDU-1 is priced at \$425 from Dataproducts New England at Barnes Park N., Wallingford, Conn. 06492.

Atlantic Research Offers Communications Analyzers

ALEXANDRIA, Va. — Atlantic Research Corp. has introduced three data communications analyzers — the 29A, 30A and 40A Data Communications Analyzers. They are said to be powerful, low-cost units for data communications testing.

The Interview 30A and 40A series are able to send and receive programs or captured data, either to or from another unit or a data recorder/data base, a vendor spokesman said.

The Bit Error Rate option performs the industry standard bit/block error rate tests for both synchronous and asynchronous data channels. Counters for all seven test parameters are displayed simultaneously and updated real-time at line speeds up to 64K bit/sec full duplex.

The 29A is available for \$2,995, the 30A for \$3,200 and the 40A for \$3,750 from Atlantic Research Corp., 5390 Cherokee Ave., Alexandria, Va. 22314.

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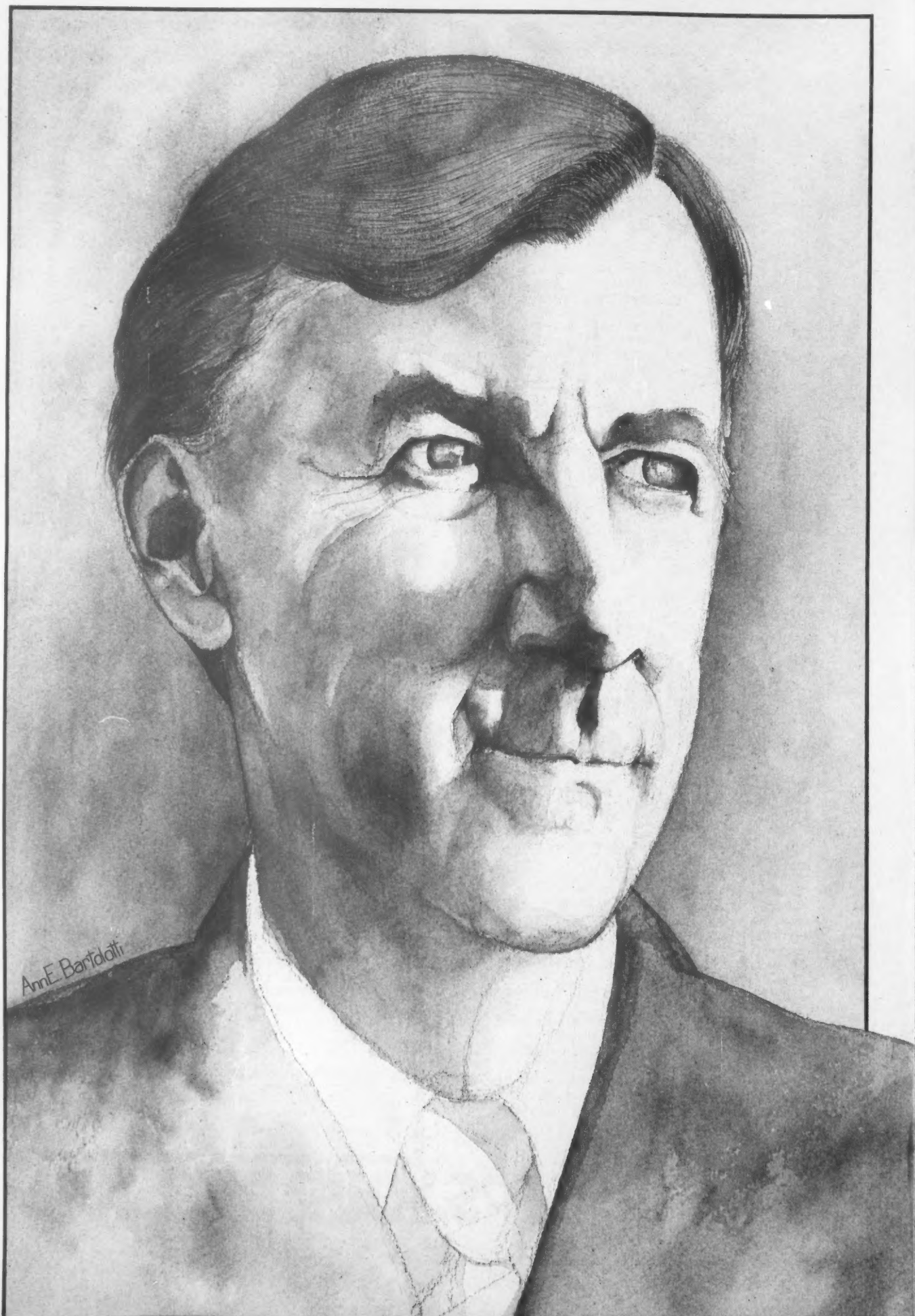
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James Martin

TALKS ABOUT THE DATA BASE ENVIRONMENT

Facing a small farmhouse on a thickly wooded Vermont mountain-side are a series of man-made ponds. They were created by James Martin. The man internationally respected as author, educator and consultant, the industry "guru" who has appeared on radio and television on six continents, is the same man who feels most at home in Vermont's Green Mountains. Heavy earth-moving equipment had to ascend a winding dirt road to hollow out the pond beds. The waters now attract deer and birds, much like the nearby beaver ponds which Martin greatly admires as "marvelous feats of engineering." His profound respect for rigorous engineering would surface again and again in our conversation with Martin in that Roxbury, Vt., farmhouse.

Raised in rural Leicestershire, England, and educated at Oxford, Martin served in the British armed forces before taking his first job with

IBM in London. He spent a total of 19 years with IBM both in the field and in development laboratories. He is founder and chairman of the board of Data Design, Inc., specializing in data base and information engineering, and chairman of the DMW Group, covering telecommunications. He has also been a high-level adviser to several governments.

Martin has written 30 major books on computers and telecommunications; several more are in progress. He also spent two years writing a visual thriller on the future implications of technology and is seeking funds to televise it.

Martin teaches via several formats, including video training modules through Chicago-based Deltak, Inc., and one- and five-day seminars through the Technology Transfer Institute, Santa Monica, Calif. Following a week of filming at Deltak, Martin took time out to talk about a current major interest: the data base environment.

Data base seems to be a focal point of much of your recent work, including a set of seven interlocking books you are currently writing on implementing data base systems.

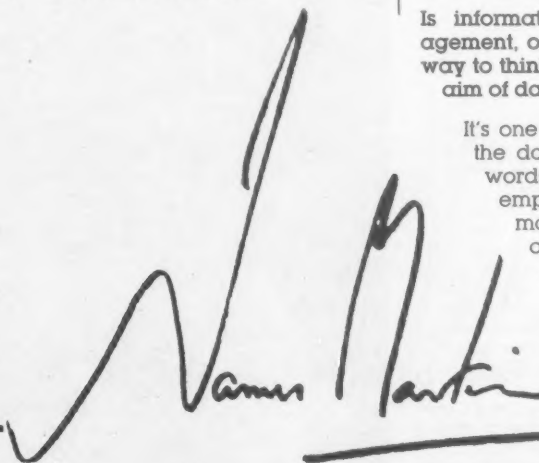
Commenting on that effort recently, you said, "It's my opinion that data base is the foundation stone of most future data processing. I think it's very important and that's why I'm going to stress it in these books."

Why "the foundation stone"?

Information resource management is really all about data. The whole point of data processing is to process data — to get the right data to the right people in the right form. So that's why data base technology is a foundation stone. Being able to get the right information and manipulate it in the corporation.

Is information resource management, or IRM, a meaningful way to think about the ultimate aim of data base?

It's one of the buzzwords of the day, but like all buzzwords it can either be empty or meaningful. To make it meaningful, one has to look at the engineering techniques which are



JAMES MARTIN INTERVIEW

In Depth/4

IN DEPTH

necessary. I find that many people who talk about information resource management do not understand the tools and techniques that are necessary to make it viable.

The tragedy of the computer industry today is that such vast numbers of people are being trained in methodologies which they pretend are engineering, but in fact they are all fairly ad hoc manual methodologies which do not meet the standards you would expect from respectable engineering tools. Those respectable engineering tools do exist.

What went wrong with the tools and methodologies of the '70s, including structured methodologies?

It wasn't so much that anything went wrong, but that we should have evolved to better methodologies. Now we've got better computers and cheap computers, and a better understanding of how to create applications.

If one were to look at a very large DP organization using the methods of the 1970s, one would find a very long application backlog, very high maintenance costs and many end users giving up on DP — not even bothering to ask for new applications, because they can see how long the DP department takes. Today the average Fortune 500 corporations have a backlog of three years, and perhaps some of them much more than that because of that "invisible backlog."

So those are some of the major problems of the traditional approaches. And when you look at what the traditional approaches are, it's not really surprising that you have these problems. Because DP departments do everything by hand. And they don't do any data base planning...

Is there a place for structured methodologies within today's data base environment?

Oh, certainly, there is. The thing that I think one has got to get rid of is hand methods which are full of mistakes. Structured design, as it's taught in most courses, is a hand technique.

Most of the tools and techniques that are necessary to success in data base design are simply a mystery in many courses, seminars and DP organizations. Having said that, you've also got some absolutely superb DP organizations that are doing the right things and producing excellent facilities.

The important thing is that we now have tools and techniques for achieving rigorous design. That's certainly not what's going on in sloppy structured programming and structured design.

Are you talking about information engineering — as described in the book you coauthored with Clive

Finkelstein — when you refer to the tools and techniques that are necessary?

I think information engineering is a buzzword like IRM which is useless unless you link it to the tools and the software that are now becoming available. You know how these buzzwords go through the industry. Lots of people, for example, when they use the term "software engineering" don't mean anything that has any

flavor of engineering about it at all. So rather than selecting a buzzword, select the tools and techniques for doing the job.

What specifically are these tools?

Oh, there are lots of them: Data Designer, a synthesis tool from Data Design, Inc.; a lot of good nonprocedural languages; a lot of the tools for generating applications without any coding; specification languages —

some specification languages are automated. HOS software from Higher Order Software, Inc. in Cambridge [Mass.] allows you to engineer complex systems with error-free code.

So there are lots of very good tools around.

Is the emphasis on automated tools a departure from the way information engineering has been thought of to date?



IN DEPTH

The emphasis on automated tools is mine. One of the strong views I hold is that in order to really progress with data processing, we've got to automate our own job. Systems analysts and programmers are often remarkably reluctant to do that. They apply tools to everybody else, but not to themselves. Good tools are coming into existence for helping to automate data base design.

Have you observed successful infor-

mation engineering in practice?

Oh, absolutely, yes. But information engineering has different meanings to different people. I think one ought to stress the engineering part of the term.

If one looks at what professional engineers in other areas do and compares it with what typical programmers or systems analysts do, you certainly can't call what they're doing engineering. Engineers in other dis-

ciplines are very careful with their tools. They develop the best tools they can for doing the job, they have mathematically based disciplines for doing calculations, and they produce good results.

On the other hand, most programmers are doing things in a completely ad hoc hand fashion. So are most systems analysts. And although they call their techniques structured, that doesn't reduce the fact that they're manual techniques, absolutely full of

errors, extremely expensive to do maintenance on and largely lacking in rigorous design.

I understand that you've done consulting for about half the Fortune 500 companies through your two consulting firms. Have you, in the course of your consulting work, observed any change in the attitudes of top managers, a greater awareness or acceptance of data base?

Oh, yes, much greater awareness, much greater acceptance. It's grown strongly over the last five years. A great frustration, though, is that they can't get results when they want them. Now they understand what they think computers ought to be doing for them, but if they can't get those results...

So you quite often get a situation where top management has a little board meeting to decide that they ought to get something done. Then, a few days later, the data processing department comes back to them saying, "You can't do that, that's not the way the program works." Then management says, "Well, change the programs!" Then the DP department says, "It might take us two years to change the programs."

Top management can't understand why, very often, and they get very frustrated with this difficulty of change, which is characteristic of a lot of data processing today.

If, as you suggest, top managers have a greater understanding of what computers can do for them, how far are they willing to get involved in the data modeling processing?

I don't think top management will have to get involved very strongly in modeling the data, but they can delegate people who are knowledgeable about the data and motivate them to do it.

Who should be involved in the data modeling process? Is the process best carried out by an individual or by a committee?

Modeling the data I don't think works by committee. I think you need one person in charge who knows exactly what he's doing and who's a real professional in that area and who's got the right automated tools to help him. The attempt to do information engineering without tools is ridiculous.

So you need, first, a very professional person, the data administrator, who understands how to build stable data base systems and how to operate the modeling tools. Then there needs to be the attitude in the corporation that management everywhere is going to help him to do his job well, help him understand the data, check what he's building and get the data agreed upon. To get it straight throughout the corporation and get

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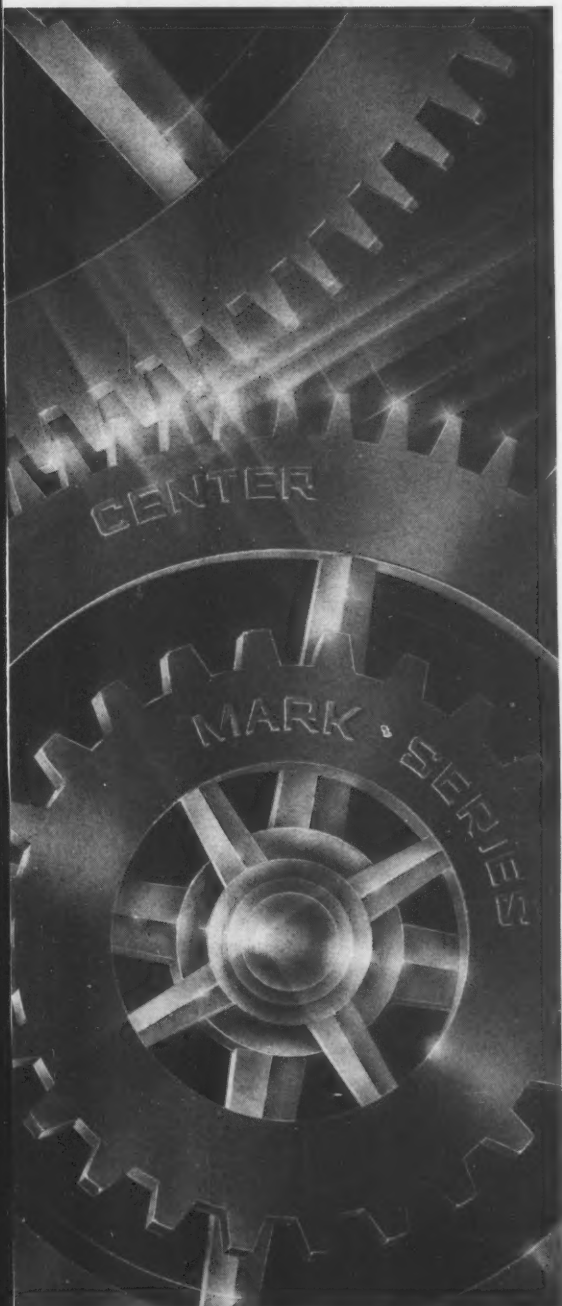
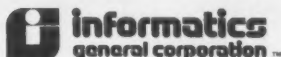
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THE SOFTWARE ENGINEERS



JAMES MARTIN INTERVIEW

In Depth/6

IN DEPTH

separate departments defining data in the same way is often very difficult — not for technical reasons, but for human, political reasons.

So the data administrator has got responsibility in building up the model, but he's drawing expertise from all the different departments and finding out who are the experts on the subject matter and letting them help him get the data together.

Where do you position this data ad-

ministrator with respect to the typical MIS manager?

You usually find him reporting within the MIS department. But it's probably a good idea to have him reporting to top management. You need to put him in a high enough position to give him enough clout to implement what he wants to do.

So having him report to the chief MIS executive is usually not a good idea.

In the acknowledgments of your *Information Engineering* book, you credit Dr. Ted Codd for inspiring information engineering through his work on relational data base theory and normalization.

Given that information engineering has its roots in data base and systems technology, how do you encourage that critical ingredient — top management enthusiasm and support? In other words, how would you answer the skeptical ex-

ecutive who says, "Information engineering is a foreign methodology to top management. You're imposing a computer-oriented discipline on a management discipline."

I haven't encountered people really saying that. One has got to make sure that one is solving the problems of top management in business, so techniques are very necessary in translating the requirements of top management into specifications that are automatable. That should be an important part of information engineering.

So you haven't encountered top-management resistance to information engineering, in favor of more business-oriented solutions?

If top management wants to get at the information resources in the corporation, they've got to use engineering techniques for doing it. It's like building a factory. You can't build a factory without engineering techniques. You can't build data processing without it.

The basic premise of information engineering is end-user participation in identifying data and designing data models, whether that end user be the top manager, clerk, accountant or factory foreman. How do you encourage end-user involvement at all levels?

I think they need some training. Not training in the technical detail. They need some motivation to see that they're going to get something out of it. Getting end-user top management to understand what it's all about is very necessary.

You refer to "user analysts" as the end users involved in the data planning process. Who are these user analysts?

You may be using analysts from the DP departments who communicate very well with those end users who are experts on the subject matter. That's the way it normally happens. Or you may have analysts who come from the user departments, rather than the DP department, who will then learn enough of the technology so that they can analyze the data, build the models of the data and go beyond building the models to creating the procedures that use the data.

In *Strategic Data Planning Methodologies*, you describe the entity-analysis study as an opportunity for corporate reorganization and a reexamination of corporate procedures. In that study effort, you again stress the importance of intelligent end-user involvement. "If a user analyst is not somebody whose time they hate to give up, he is the wrong choice."

Well, what I'm really saying is that



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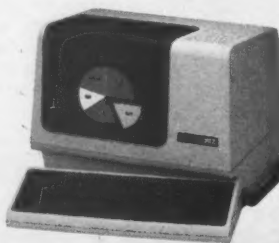
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IN DEPTH

sometimes the user departments take a skeptical view of DP. When DP comes and asks for help, they say they want a man for three months, and end users say, "Well, let's give him Charlie because we don't know what to do with Charlie, he's a menace around the place anyway." If that's the basis of personnel selection, you get someone who's not going to be very good at building the data models. You really want a person who is an expert on the data subject matter and who can think clearly.

I'm fascinated by the notion that end users will be willing to accept this new task, building the data models for their enterprise, which means for them a new way of thinking. Whether it's data processing or anything else, very small changes in procedure can be met with profound resistance, not because the new procedures are difficult or complex, but because they represent change. How do you overcome resistance to change?

This is the problem with the whole of automation at the present time. You've got to devise the right sort of motivations for people who are having their work changed. Financial motivation is a fairly good one. The motivation of making their job more interesting can be a good one, if managed appropriately — or the motivation that they're likely to have a better promotion path if they learn the new technology. You find some organizations employing industrial psychologists to study how one should choose the workings of a bank or the workings of a factory in order to bring about the very rapid rate of change that is necessary.

Do you think people can be taught to accept change?

Oh, yes. When one looks at different

'One of the challenges for management in general today is to build an electronic corporation. Computers challenge management to change the way the corporation works, just as robots challenge the way the shop floor in a factory works.'

corporations, one finds some that are capable of absorbing an amazingly rapid rate of change. IBM management, for example, can change the whole company very quickly indeed. It's pretty much a part of the management style. You find other corporations where the management of change has never really been given much emphasis, so they have great difficulty making the changes that are necessary.

The MIS manager then becomes an agent of change. And I think it is very important that he understand the true needs of the business. He should think like a business person. He ought to communicate with the business people, in particular senior management, in order to understand their true needs. You can contrast that with people like the technician, who just thinks like a technician rather than a business person who understands the motivations of people whose jobs change.

We're tending to see today an MIS executive who's much broader in business skills than the MIS executive of the 1970s.

Again in *Strategic Data Planning Methodologies*, you have written, "The data base plans most beneficial to the corporation tend to be counter-political." Is there an anti-data base sentiment?

There's not so much an anti-data base sentiment. What I really meant by that statement is that as you plan the data models in the corporation,

you're cutting across several people's departments. Say, two departments that are basically rivals might need to use the same data model. There are all sorts of empires and human motivations in the corporation, and the tendency to ignore those when you create a corporatewide data model — or, for that matter, when you create a corporatewide network or other very important corporate resources — can be disastrous.

Do you envision political upheavals in the computerized enterprise of the '80s as a result of data base implementations?

In the badly managed corporations, yes. I think there are good ways to manage the evolution toward new types of information sources that are needed. And one does see some cor-

porations managing that very well and certainly not having political upheavals.

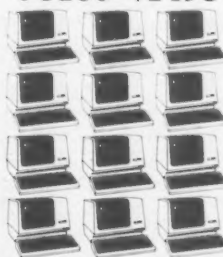
So it's a question of good management.

It does appear, though, that we are seeing something of the tail wagging the dog: Insights gained from data base techniques, which are intended to model the enterprise, are changing the structure of the corporation itself. In this way, the resulting upheaval needn't be seen as a danger but as a management opportunity to make some positive changes.

Yes, I think that is the case. Not just data base techniques, though. One of the challenges for management in general today is to build an electronic corporation. Computers challenge management to change the way the corporation works, just as robots challenge the way the shop floor in a factory works.

When I look at the information engineering model [see Figure 2 on In Depth/29], it appears as though conventional data processing occupies a "back burner" and that end-

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IN DEPTH

user activities dominate the whole scheme. Is it a diminishing role you see traditional DP assuming?

Well, if by traditional data processing you mean the manual drawing of flowcharts and data flow diagrams and converting these into Cobol programs which are structured with techniques that we used in the 1970s, then yes, we should reduce that as much as possible. The point of information engineering is to get the

right information to the right people.

So you wouldn't say that the MIS department's role is diminishing, but rather that MIS staff should be moving toward a greater involvement in the new information technology.

That's right. We are going to see lots of end users using languages of their own for application development,

but that doesn't mean that the role of the MIS department is going to diminish. It just means that computer technology, including data base, is going to be much more widespread, and the end users are going to need an infrastructure to support them. And that infrastructure needs to be very well designed.

So, no, the data processing department is not going to disappear, and the role of MIS is not diminishing. It's growing.

Do you see an evolutionary process with information engineering? Will the associated techniques need and undergo continual refinement?

Oh yes, sure, we continually refine. It's quite clear, although in the really good installations we're doing the DP job in a very different way than we did five years ago, nevertheless there's still more refinement to be done.

In fact, I think we're on the cliff edge as far as methodologies go at the present time. The best methodologies now are enormously different from the methodologies most installations are using.

I think it's the challenge of today's data processing manager to make sure that he and all of his staff understand those methodologies. As yet, most of them don't. And so we are today seeing a very dramatic change in methodologies.

How many ways are there of correctly modeling the data of an enterprise? That is, after the user views of the data are gathered and synthesized and boiled down into third or fourth normal form, is there one and only one correct or canonical schema?

It would be true to say that if you give me a certain collection of data item types, there would be one and only one conceptual or canonical model of that data.

You're certainly going to get lots of different views to start out with. But those end-user views are all extracted from one common source.

So a lot of corporations are working towards a conceptual model or set of conceptual models which are the foundation stone for the company systems that are needed.

If we can create a flawless data model, shouldn't that mean that we are on the way to producing bug-free programs?

No, because the model is only the data and not the logic. You've got to get the logic right in order to get bug-free programs. There are tools in existence today with which we can solve the syntax problems and the internal semantics problems, so that the only bugs in programs will be external semantics.

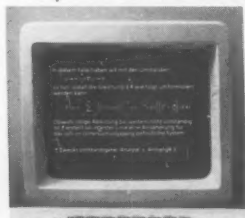
Will we ever see bug-free programs?

That depends on what you mean by a bug. If you give a programmer the wrong instructions, if you give him wrong objectives, the wrong results come with it.

But I think pretty much you can say that in the 1990s we will look back on today's structured techniques as something almost ridiculous. We will have techniques then with which we will be able to translate specifications into code that accu-

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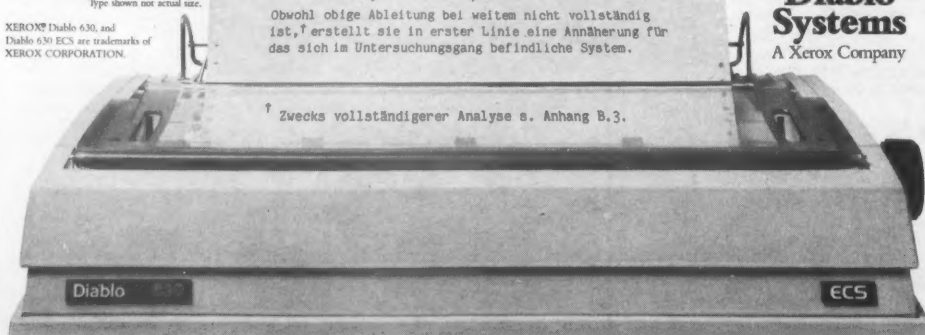
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JAMES MARTIN INTERVIEW

IN DEPTH

rately represents those specifications, without bugs — unless there's something wrong with the specifications and the computer can't handle it. That's a human problem.

One has got to get a thorough data model, and a correct data model has got to be based on a correct look at the information requirements. And having got the correct data model, one then has to have a means of creating correct programs that employ the data. And as soon as you say "correct programs," that rules out hand coding, since you get correct programs only rarely by hand coding.

So today we are seeing many different types of report generators, query languages, graphics generators, application generators, which do not require hand coding. And we are also seeing other methodologies that depend on computer specifications of statements, so that one can break down the specification statement into finer detail until it becomes convertible into code.

Are you currently developing new methodologies?

Always will be, yes. But I don't think one ought to talk about one single methodology. There's a whole mosaic of different methodologies which fit together and do different things.

When you're looking at methodologies, you've got to select something that fits together in a reasonable fashion, has its own standards for achieving the results you want to achieve.

You are not saying that the choice of methodology is not all that important...

No, I think it's extremely important. But we're probably going to end up with not one methodology but several, depending on the different facets of the system you're going to implement.

One of the difficulties that DP executives will have is that everybody and his dog is peddling a methodology, and at least 90% of those methodologies are not really very respectable. So he's got the job of sorting out the sales hype from the ones that generally have the capability to greatly increase the quality of the systems.

I've encountered that problem voiced by some *Computerworld* readers, who find they are deluged with methodologies. One reaction is to forget all of them and just revert to the way they had been doing things in the past.

That's exactly what people are doing. And that's disastrous! We are indeed seeing a deluge, and people can't sort out the ones that are really good. So this is what I consider to be the purpose of my seminars, to put the whole subject into perspective, to find out people's objectives and then

'One of the difficulties that DP executives will have is that everybody and his dog is peddling a methodology, and at least 90% of those methodologies are not rigorous and not really very respectable.'

to say, "Now let's look at those aspects of computing products, including methodologies, which, as far as I can see, best meet those objectives."

In the seminar this fall we won't be talking about one methodology; I'll be trying to put them into perspective, and then picking out and isolat-

ing those that are way ahead of the rest in achieving quality results at a greater speed.

Are you going to be introducing any new tools or methodologies in those seminars?

Yes. I wanted to have one session in the course on the subject of provably correct code and a methodology that can achieve bug-free programs.

There are various methodologies,

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IN DEPTH

but one that I'll want to talk about is software called HOS from Higher Order Software. It's a specification language by which a user can create specifications that can be decomposed in a rigorous fashion until you can generate code that is provably correct.

Is this a language for end users?

No, it's for DP professionals. There are other end-user tools and end-user languages. Today we are getting some excellent tools for DP professionals and some for end users to generate code for error-free programs.

In addition to your seminars, you also do a great deal of teaching via Deltak television training modules. What do you feel about television as an educational medium? Will television play a greater role in promoting technological awareness?

It certainly should. It's grossly misused today. But it's an extremely powerful communications medium.

The problem with television today is that most television is designed to sell soap powders. That's not exactly the same objective as improving the educational or cultural quality of society. And I think that as long as the main motivation of television is to sell, or to make advertising effective, then that is in conflict with the objective of getting a very good education with the rich cultural resources of this society.

Now today we are seeing a fairly rapid spread of private television facilities of different types for education in specific areas — for example, what Deltak is doing. And this type of canned education is going to be a very rapidly growing business. There's going to be a lot of money in it. It has the advantage that you can get the world's best teachers and capture them, and an extremely large number of people see them and can be taught by them. So you get a very high leverage.

It's a very powerful new technology which I think is going to have an acute impact on the world, including the Third World.

I've read that Japan is doing something like that with what they call a "technology peace corps," sending systems analysts to developing countries to assist in technological development.

There are large numbers of Japanese traveling to make money, to sell Japanese products and to capture ideas they can take back with them and cash in on. I wouldn't call it a peace corps.

Look at what the Japanese have done to the hi-fi industry, and to the camera industry in Germany, and to Detroit. If that doesn't make one apprehensive about what they might do if they conduct a major attack on

the computer industry, then it ought to. It's a stated objective in Japan to take as much of the major computer industry away from the U.S. as they can. They're clearly putting together new architectures now which are very interesting, at any rate.

Will they succeed, then, at creating original technology?

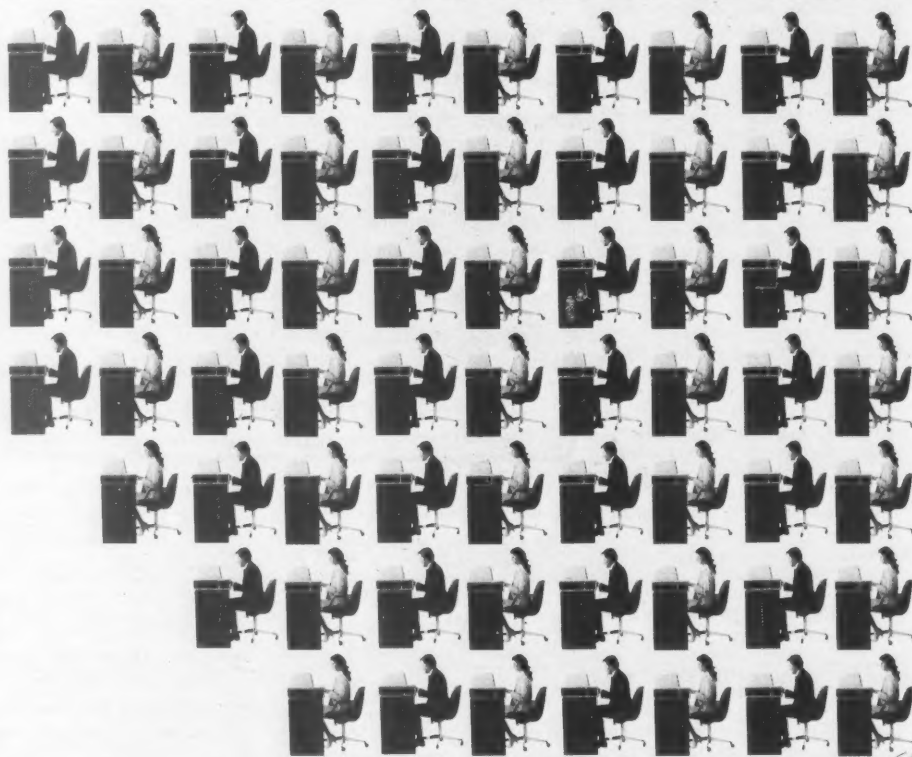
Oh, I think they will. They seem to have a big problem in the field of

software in Japan. But now that we're saying that with almost any software there are techniques to avoid hand-coding, if the Japanese latch onto those techniques, then they'll solve a lot of their software creation problems. It's a factor that will make them much more dangerous since software is so critical.

Do you think the Japanese are going to outstrip the U.S. in software development?

I'm not sure they are. I can't see the Japanese doing a good job in software development.

Part of the Japanese fifth-generation computer project is advances in data base technology — user-friendly languages, highly intelligent user interfaces, data base machines ... But this project has been dismissed by a lot of people as too ambitious, "blue sky." Should we worry about Japan's fifth-genera-



0 to 60 without shifting

tion computer project?

I think we should most definitely worry about it. Most of the things they said they're going to do in the past they have in fact done. Certainly there are aspects of the fifth generation that give cause for skepticism. But I think it's very likely that they will build the hardware they're talking about. That hardware will be extremely competitive on the American marketplace.

'I should say that I'm generally not an advocate of central government in anything. I'd much rather advocate private enterprise and freedom and individual initiative and encouragement for people to be motivated by getting their own results.'

I would be very surprised if the Japanese don't build highly powerful computers and data base machines,

machines with which one can create knowledge bases and machines with very great human factoring. I'm not

totally convinced they're going to build software.

Certainly at the present time, America has far better technology for building software than the Japanese do. The problem is that many corporations are just not using it. They talk of structured programming as if that were a good methodology.

What gives Japan the ability to capitalize on American technological developments, like robotics and semiconductors, and now perhaps data base technology? Are Japanese corporate structures more resilient, more adaptable to change?

I'm not sure that they are more adaptable to change in general. They certainly haven't our problem with labor unions. There aren't any unions of the type that the West has at all. The only unions are those that exist within corporations, and the unions agree to sit down with management in endless committee meetings. They go into a great amount of discussion about what they're going to do before they do it, and once they do it, everybody charges off in the same direction.

There is a very high level of teamwork and cooperation among all of the various people involved. And then they have a management atmosphere in which if anybody is a bad team member, and violates the consensus that they've all agreed upon, that is very bad. So, they all go after their goal and all charge in the same direction. And it's that which enabled them to automate their factories with robots to a great extent.

Do you feel that government should provide any kind of guidance, say, in establishing coordinated R&D programs to strengthen the country's competitive posture and meet the Japanese challenge?

Given the track record that the government in the West has, I'd think it much better that they not provide any guidance whatsoever. Nevertheless, the tax incentives for the proper education and the right research seem to be desirable. Perhaps the role the government ought to play is to set tax structures in such a way that would encourage the development of technology, which would in turn improve the productivity of the country.

You've stressed the importance of top-down planning and control in data base planning and implementation. What we're seeing now is a decentralization of the data base resource, with the move to microcomputers, intelligent terminals, by which end users access and even update their own data.

Does decentralization change the need for top-down planning and control?

I think it makes it stronger. I should

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IN DEPTH

say that I'm generally not an advocate of central government in anything. I'd much rather advocate private enterprise and freedom and individual initiative and encouragement for people to be

motivated by getting their own results.

Nevertheless, I wouldn't want to live in a society with no government. We need sewers and telephones and so forth. And you can't really

have a telephone system without some sort of central planning. AT&T couldn't work if every town designed its own numbering scheme for operating its own exchange. And so you've got to

have some standards in order to make things work.

Well, now, a very important part of the infrastructure of a large electronic corporation is the standards for representation of data. And an-

other important part of the infrastructure is the standards for networking throughout the organization. And these have really got to be corporatewide if they're going to be as effective as possible. But once you've got the right data models in place, and you've got the right network in place, then the end users will have much more capability to do their own thing. Much more capability to invent their own applications.

So the type of central planning that I would hope for is that type of planning which maximizes the potential for initiative among the peripheral groups and end users. I'm perfectly happy to see end users getting their own minicomputers and their own microcomputers and so on. That's wonderful. And they're inventing all sorts of applications which I don't think I would invent, or that most of the analysts I know would invent. So we're getting all sorts of new ideas bubbling into the computer industry because of that.

But we do need to give end users the resources to enable them to connect their computer to the larger packet networks, and we do need to give them the resources to find the information they want to manipulate. And they're simply not going to find it unless we plan that aspect of information engineering that gives a good data model and a good representation of the data in the dictionary.

What about distributed data base — say, distribution for a large corporation with multiple divisions around the country. Should such a company be working with one set of data models, standard data definitions in the data dictionary which apply across all those divisions?

If you're talking about Citibank, I think it's vital that there be one data model which applies to their operations throughout the entire country, and one set of data models which are designed to work together. It depends on the type of corporation.

If you're talking about a very loosely tied corporation, which has all manner of different firms and different businesses, then you wouldn't want central planning of the data.

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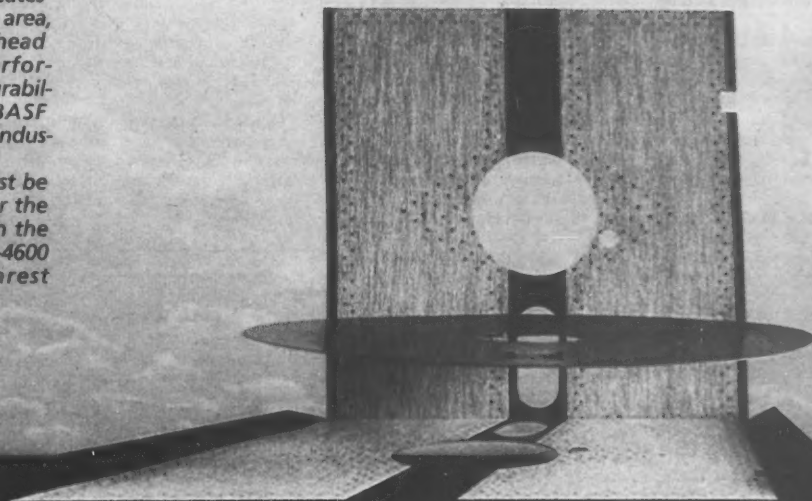
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IN DEPTH

mation engineering has its roots in relational data base theory, which means the data models derived from information engineering techniques can be mapped directly onto commercially available relational software.

Beyond that obvious convenience, is there any inherent advantage in choosing a relational DBMS over a Codasyl, hierarchical or other type of DBMS? In other words, is the relational vs. Codasyl vs. hierarchical debate a meaningful one to users?

That debate is certainly meaningful. And it's a very complex one. And I think the most important thing to look for in selecting data base facilities is the capability to get results quickly. In order to get results quickly, you'd like to avoid hand coding wherever possible.

And the data base management system is a strong factor in getting the ability to develop applications without hand coding. So the capability to get results that are accurate, error-free, respectable and quick is more important than the debate about the application of relational or Codasyl or IMS.

Having said that, I think it's going to be easier to achieve that objective with relational data bases than with Codasyl or hierarchical data bases.

Do you think IBM will replace its current flagship, IMS, with relational offerings?

I think IBM will have both. IMS is certainly not going to go away. It's such a gigantic customer base. Certain corporations in the United States have invested more than a billion

'I think the most important thing to look for in selecting data base facilities is the capability to get results quickly. To do that, you'd like to avoid hand coding wherever possible.'

dollars in IMS applications. So there's no way that IMS can go away quickly.

And IMS is a pretty good data base for supporting prespecified applications where you've got high production volumes. But at the same time, you want a completely different type of data base for supporting decision support systems. And IBM knows this very well.

So I think that for the next 10 years we are going to see two types of data bases: one that is giving support to relational-type information systems and another giving support to IMS-like systems. And those two types of facilities may cohabit the same software system in some cases.

According to one source, all of the major hardware vendors in this country have relational-type products under development.

I think that most of the ones that are "with it" in data base do, yes.

There's no question that relational is the way to go at the present state of the art. That doesn't mean that we should write off Codasyl or IMS. They are good for prespecified, high-volume production systems. The main reason we don't write them off is just that there's such a vast number of nonrelational applications out there.

The Codasyl standard is the result of a committee, and now a relational data base task group is working to establish a standard for relational data base. Is standardization a move in the right direction?

One wants to make sure that the standards are capable of being implemented in multiple different fashions. It's certainly true that premature standardization can inhibit new developments, just as the standardization of the typewriter keyboard did. But certainly getting standards for relational data processing in general is felt to be constructive. Enormously.

Incidentally, something enormously important to say to the standards committees is that they are producing standards which are not provably correct. So the standards committees need better engineering tools! Just

like DP departments.

I've just been looking through the manual of many hundreds of pages that has just been produced as a new standard for the International Standards Committee. It was full of exceedingly complex logic, as good standards ought to be. And there's no guarantee whatsoever that that logic is correct. Now there are techniques today which that standards committee could have used to automate their work. So the standards committee is like the DP executives who haven't been educated in what tools exist.

The dream of the '60s, I think, was to have totally integrated corporate data bases. Is this ever going to be feasible?

No, I don't think that is really feasible. It's too difficult to do. What one can do instead is to say, "Let's understand all of the entities about which we store data throughout a corporation and make sure we've done all those in the data dictionary and the data model and understand what types of attributes relate to those entities."

So, while no one computer or no one data base is completely integrat-

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IN DEPTH

ed, throughout the corporation, your strategic planning is completely integrated, or 90% integrated, throughout the corporation.

That means when you've gotten to that stage of integration, data in one place can be transferred, if you need to, to another place, or management can bring together data from many different locations that have the same meaning, that are defined the same way, modeled with the same modeling tool.

What are your predictions for the data base environment?

Coming — very slowly — data base machines, as opposed to data base software. New storage technologies, including digital-optical recording, which has the property that you can't update in place.

So therefore we are going to need methodologies that enable us to design data base facilities that will include data you can update in place as well as data you can't. Those two things coexisting.

Better data base languages — a wide diversity of different data base languages, some of which are end-user languages and some of which are languages for DP professionals. An extension of the design tools in data base. Better automation of high-quality design methods.

And something that is not quite data base, and which may not quite be the answer to your question: that is, the growing strength of knowledge-base technology.

Based on artificial intelligence?

I hesitate to use the term artificial intelligence. "Knowledge base" now has become a rather specialized technique which is much more descriptive than the whole subject of artificial intelligence. But it *did* derive from artificial intelligence, you're right.

The whole field of "expert systems" will be, in some cases, of historically new dimensions, by means of languages that allow a user to handle the semantics created in the system.

And the language that is by far most popular in Europe and Japan, and which almost no attention is being paid to in the United States, is a language called Prolog. Prolog is easy to use, at least easy in terms of handling the syntax and semantics, and it's a language that yields to creation of a new kind of language. It's a language we're going to hear a good deal more about.

And we are going to see hardware, clearly in personal computers, that is designed with parallel processors, multiple parallel processors, intended for languages totally different from Cobol.

Looking back over the data base developments of the past two decades, how far have we come since the '60s? Has data base assumed a great-

er importance now?

Oh, much more, much more now than in the '60s, yes. Data base wasn't really understood in the '60s at all. It began to be understood in the '70s, but one needed much better software than a lot of the software in the early days. Now we're beginning to get very good software.

One of the most important things in computing today is to get applications built fast. With all the most im-

portant applications, if you don't get information within days or weeks, then you don't want it. You need that information for something you're doing now.

We're getting lots of new software that can give people fast results. Most of this depends upon data base. A lot of it resides in data base software and a lot of it plugs into data base.

But you've got to have the data fairly well thought out before you can

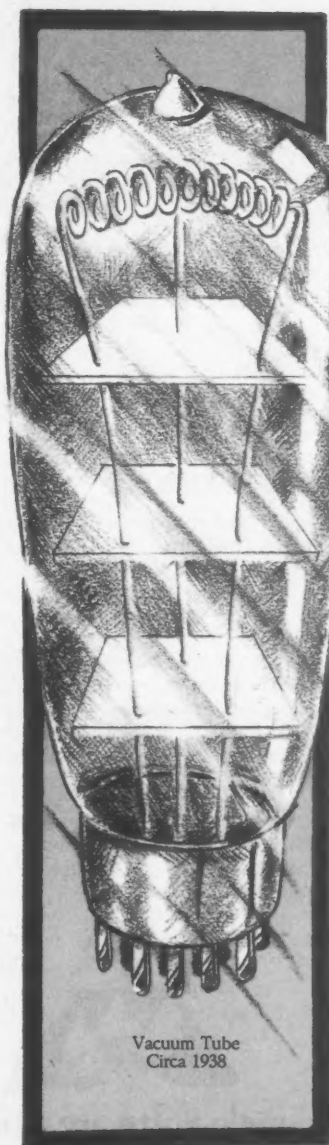
use it, so this is the reason that *planning* data base is so important.

Today, are we close to achieving the promise — the full potential — of data base?

Oh, no, nowhere near.

About the Interviewer

Catherine Marengi is Computerworld's senior editor, features.



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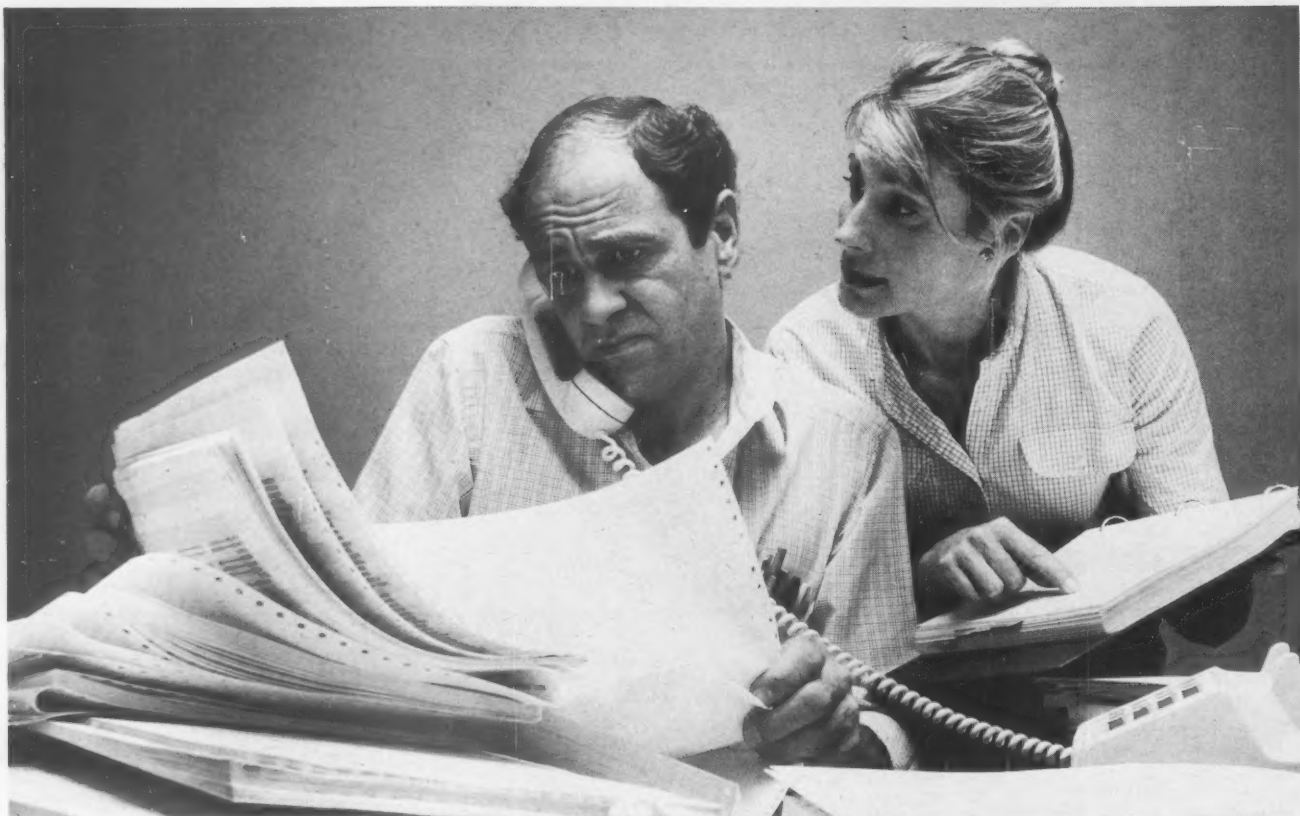
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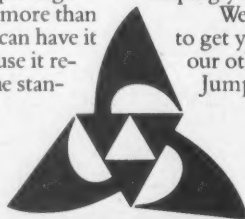
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AN OVERALL PLAN

By James Martin

It would be unthinkable to build a battleship without an overall plan. Once the plan exists, separate teams can work on the components.

Corporate information engineering is not much less complex than building a battleship, yet in most corporations it is done without a plan of sufficient detail to make the components fit together.

The architect of the battleship cannot conceivably specify the detailed design of the guns, electronics or other subsystems. These have to be developed by different teams working autonomously. But imagine what would happen if the teams enthusiastically created their own subsystems without any coordination from the top.

The data processing world is full of inspired subsystem design-

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IN DEPTH

ers who want to be left alone. Their numbers are rapidly increasing as minicomputers proliferate, end users learn to acquire their own facilities and user-friendly software spreads. In many cases, they are doing an excellent job. However, the types of data they use overlap substantially and this is often not recognized. The subsystems need to be connected, but often this cannot be done without conversion. When the need for conversion becomes apparent, it is often too expensive, so incompatible systems live on, making it difficult or impossible to integrate the data that management needs.

In the late 1960s, the dream emerged of a totally integrated corporate data base. This was completely unworkable. The task of building one data base system for a corporation is unthinkably complex. It is far beyond the capability of any one team to design; and even if it could be designed, machine performance considerations would make it unworkable (except in small corporations).

Good system design avoids excessive complexity. Corporate information systems ought to be composed of discrete modules, each simple enough to be efficiently designed,

completely understood by its design team, low in maintenance costs and susceptible to high-productivity development methods (such as the use of high-level data base languages). But the modules must fit together, and they will not do so unless designed with planning from the top.

Much of the information in distributed systems and minicomputers is used by other people in different locations from that minicomputer — in different parts of the organization. Data in one subsystem is also needed by others. Yet in many organizations, each subsystem designer independently creates his own data.

An organization needs top-level planning, with appropriate design tools, to pull the act together.

Corporatwide planning of data bases is vital, but corporatwide design of an integrated data base is impractical. What is needed is bottom-up design of individual subsystems, with maximum encouragement for local initiative in creating such subsystems, and a methodology for top-level planning of the data resources these systems use — like the building of a battleship.

To build a computerized corporation, it is essential to have both the top-down planning of data and the localized design of data bases in many different user areas. Where possible, the localized designs should evolve within a framework established by the top-down planning. This framework needs to be developed with sufficient detail.

A computerized methodology is needed for both top-down information resource planning and detailed data base design. The two methodologies need to be compatible so that one feeds the other. Top-down planning can be done with varying degrees of detail. It may start as a coarse summary of the resources needed, but to be useful, more detail is required.

Consistency in Information

A major objective of top-down planning is to achieve consistency of information.

Inconsistency results from the historical evolution of computer usage that usually occurs without overall planning. Data can be inconsistent in five ways:

1. *Field definition.* Different parts of the organization do not agree about the definitions and meanings of a field.
2. *Field structure.* The same field is structured differently in different places (different lengths, binary vs. decimal, different code structures and so on).
3. *Record structure.* Records with the same key are differently structured in different places.
4. *Time of update.* Data may be processed monthly, weekly, daily or interactively in different subsystems, making different copies of the data have different values. Managers often perceive inconsistent data.
5. *Inconsistency of update rules.* Processing and update logic may be dif-

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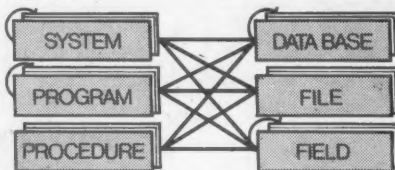
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ferent for different copies of the data.

The dangers of inconsistency are much greater now that computers are becoming cheap and widespread, so that many departments will have their own computer. Distributed processing and small end-user computers greatly increase the need for corporatewide strategic planning of information resources.

Incompatible data in separate files or systems can prevent, or make difficult, the integration of data to generate the information required by management.

Decoupled Projects

Subsystem designers, and sometimes end users, are often concerned that if they have the design of data imposed on them from elsewhere, they will lose their freedom to be creative. In practice, installations where the data base function has been well managed have demonstrated that the opposite is true. Procedure designers are given stable data structures and tools with which they can extract data quickly in many forms. The ease and speed of creating new procedures with high-level data base languages lead to much more creativity in changing and inventing procedures.

Without good data base management, the ability to change systems bogs down in maintenance problems and problems with incompatible data.

The data models that result from good data administration are a foundation stone on which new procedures can be created quickly by small teams — most often by one person. Strategic planning of data permits separate design projects to proceed by themselves. Each project can be reasonably coherent and decoupled from other projects. The separate projects can be small and easy to implement, yet they are integrated by using data that is centrally defined.

Tower of Babel

The language and software for creating commercial DP applications are really improving and will continue to do so. Nonprocedural languages and facilities now permit many applications to be created without conventional programming and in some cases permit them to be created by end users.

The image of a computerized corporation of the near future which the reader should keep in mind is one in which many people are creating and adjusting the electronic procedures. They have user-friendly software that enables them to do this rapidly.

Inexpensive computers are spreading and there is a terminal on most desks. The challenge for both DP and corporate management is: How do you control this environment? The most important aspect of control is coordinating the data used. If this is not done, there will be a Tower of Babel effect.

Building data processing throughout an enterprise without coordinated data planning would be like running a telephone system without a common directory.

If every person creating DP procedures invents his own data and designs and defines them himself, a high price will be paid for the resulting chaos. Many systems will have to be changed later or taken out of use. Higher management will not be able to extract the data it needs for higher level control or decision making. Many of the improvements in procedures and management that ought to result from a terminal-network data base environment will not occur.

Senior Management Involvement

In many cases, the attempt to create corporatewide data planning has come from the DP department itself. This is often not too successful, for two reasons. First, the DP executives do not have enough authority to make everybody conform to the data definitions and representations. Second (although they sometimes think the contrary), DP professionals do not fully understand the business. It is desirable to involve senior management itself in the information planning process.

IBM's manual on its Business Systems Planning (BSP) methodology for identifying what data base systems are needed states: "A BSP study should not be started unless a top executive sponsor and some other executives are committed to being involved in it. The study must reflect their view of the business, and the success of the study depends upon their providing the business understanding and information require-

Why Involve Top Management?

- Information is an extremely vital corporate resource. It affects productivity, profitability and strategic decisions. Any important resource needs planning from the top.
- Where a technical group has planned corporate information resources, it has generally been unable to have the perspective of business managers or to understand the overall corporate information needs.
- The best-laid plans of data base designers have crashed on the rocks of corporate politics. Data base plans tend to create political problems, often severe ones, and various factions will oppose them.
- Often, these problems can be solved only when top management has made it clear that it believes that data base is the way of the future and has signed off on a corporate information systems plan.
- Some of the methodologies for top-down data planning reveal anomalies, waste and inefficiencies in the corporate organization and methods. In many cases, the top-down data analysis has led to the reorganization of procedures and to corporate restructuring, independent of DP.
- Productivity in DP development is vital. An appalling waste

of development resources results from redundant uncoordinated application development and excessive maintenance and conversion activity. A top-down corporatewide information architecture is needed to lessen these.

- A formally structured corporatewide view of information processing is needed in order to set DP priorities.

- Budgets need to be set for data base development independently of application development.

- Subject data bases and information systems need to be planned, rather than individual files or application data bases. This requires a view from the top.

- Orchestration is needed to make the various efforts fit together. Multiple incompatible fragments of data bases cause excessive conversion costs and prevent senior management from obtaining the information it needs.

- Standardization is necessary to achieve agreement about the definitions of data items. Corporatewide standards are needed for use of a common dictionary and common modeling tool.

- An infrastructure needs to be planned for distributed systems. The separate data base systems should be linked by a common network.

ments to the team. Most of the input will come directly or indirectly from these executives."

There are many reasons top man-

agement involvement is needed in top-down data base planning. These reasons are listed in the box above.

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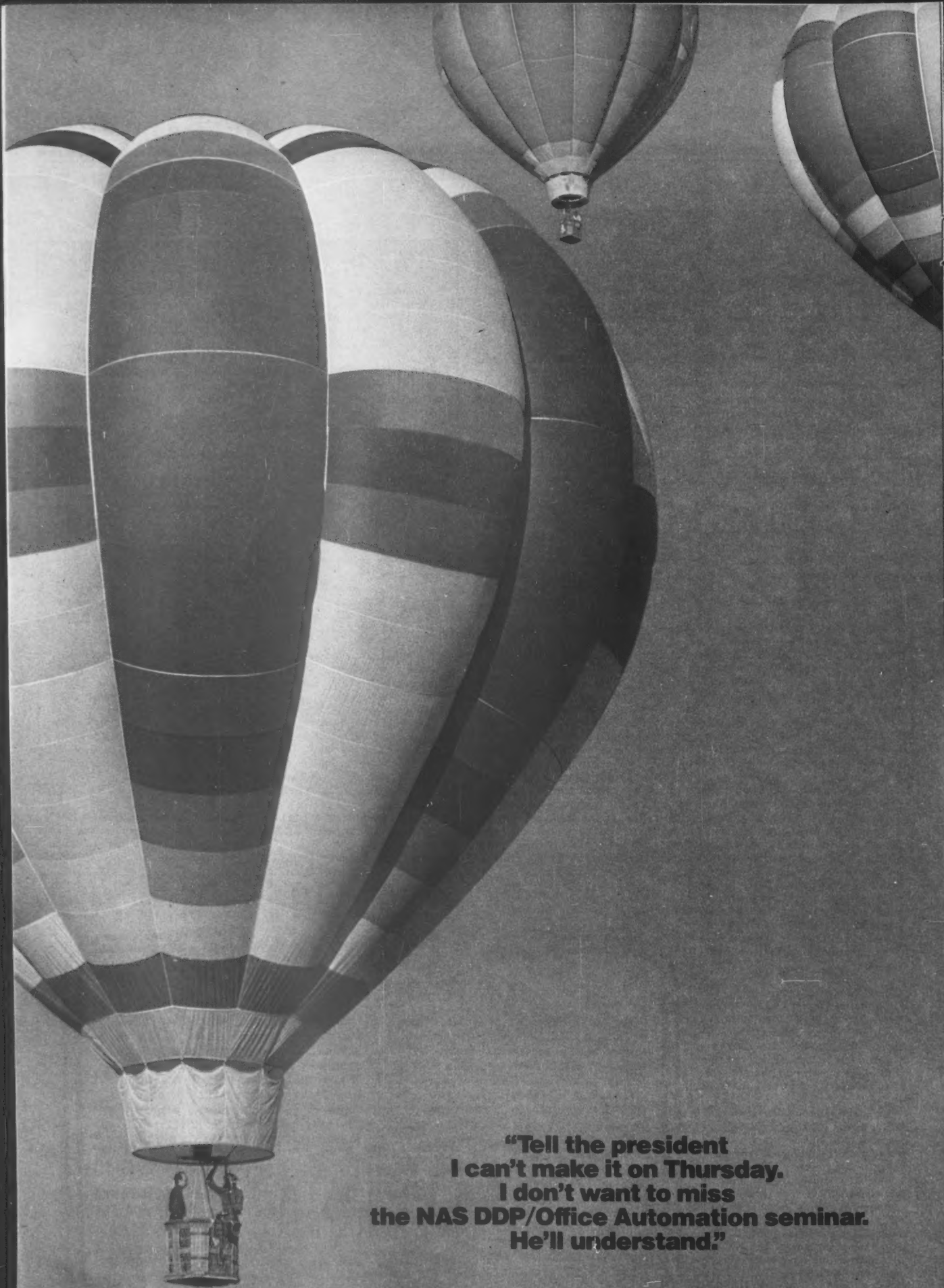
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IN DEPTH

down planning with top management involvement and sponsorship and without it. The difference is far greater than is often generally realized.

The planning done without

senior management involvement is DP looking outward. However good as analysts, DP professionals usually do not have the business experience that is needed to understand the subtleties of infor-

mation requirement. When they create a top-down plan, although it may be ingeniously conceived, it is often not accepted by senior management and has often become the basis for bitter po-

litical arguing.

The primary payoff from executive involvement is solid management support for the data systems that will eventually be developed. The detailed data modeling

is more likely to succeed, represent the enterprise correctly, be used, supported and understood.

The second payoff is more subtle but in some cases has been very powerful — the effect on the enterprise of having a fresh picture of itself. Having such a self-perception evolve, clearly charted and unaccompanied by preaching about how the enterprise "ought" to do things, is often a more effective force toward organizational restructuring than an army of management consultants who are explicitly trying to be "change agents."

Communications Gap

In many corporations, there is poor rapport between DP management and top management. There are a variety of reasons for this: DP's use of jargon, management incomprehension and fear of DP technology, DP's failure to fulfill the promises of an earlier age (especially information systems for top management) and top management's failure to understand the need for its involvement. Too often senior management regards the data administrator as a technician who lives down in the bowels of the earth.

In an organization with little or no data base experience, it is not a good idea to wait for three years, gaining experience, before approaching top management. Top-down planning is needed from the start and as part of this process, top management must be given realistic expectations about the time scale.

If there is a communications gap between DP and top management, several actions can help to bridge that:

- Bring in a consulting firm that specializes in strategic data base planning.
- Show top management video tapes on the subject. Sometimes this is done in a lunch meeting; sometimes a video player is installed in the executive's home. A careful presentation should relate the videotapes to the particular circumstances of the enterprise in question.
- Arrange for top management to go to a short seminar on the subject.
- Conduct a short but powerful in-house seminar for top management. This usually seems to work better if an outside authority presents it.
- Stress to top management that corporate or organiza-

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IN DEPTH

tional changes often result from a top-down examination of corporate data usage.

Top management is likely to be turned off completely by technical talk about data structures. It is likely to be skeptical about vague promises of better management information. There are, however, certain aspects of the subject that are likely to turn top managers on.

Senior management takes an active interest in decisions about how the corporation should be run:

- Changes in organizational procedures, structural changes or corporate reorganization are usually suggested by entity-analysis methodologies.

- Most senior managers perceive some areas where they would like better information. Sometimes they have not had an opportunity to articulate this.

- Senior management is often concerned about office productivity. Most corporations waste money because of redundant procedures or procedures that could be eliminated. A detailed charting of what activities use similar data can help clean up anomalies in organizational methods.

- Most senior managers perceive problems in today's DP operations or have "hot buttons" about what they would like accomplished. IBM's Business Systems Planning methodology is particularly effective at highlighting these.

- DP responsiveness, or speed of new application development, is sometimes perceived as a problem. Managers cannot obtain new reports when they want them. One large bank in New York indicated to the author that it had a seven-year backlog of applications. Thorough data base planning and implementation ought to increase DP responsiveness greatly as well as the speed at which new reports can be generated.

- To be competitive, top management has to build a highly computerized corporation in the near future. The basis for this is corporatewide data analysis.

DP Productivity

DP productivity is becoming a more important concern as computers drop in cost. The cost of a computer is often much less than the cost of the programmers and analysts who keep it busy.

While computers are plunging in cost, programmers' and analysts' salaries are going up. Senior management often perceives DP productivity problems in terms of how long it takes to develop

the new applications that are needed.

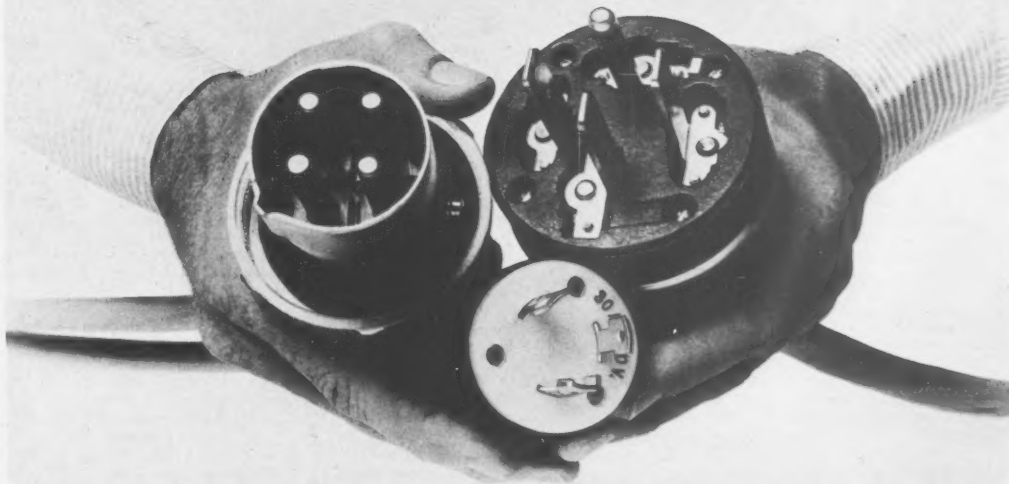
Many authorities advocate that DP productivity be attacked by using structured programming and structured analysis. These help a little.

However, the major causes of low DP productivity are not obvious and will not be corrected by structured versions of the same procedures. They include the following:

- A seemingly trivial

change sets off a chain reaction of program modifications. As systems evolve, the chain reactions grow longer and the unanticipated effects of change grow worse. DP managers become reluctant

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to make changes and sometimes say they cannot be made. This was one of the main reasons for the development of data base management systems. A complete solution to the problem re-

quires top-down planning of subject data bases, skilled logical data base design and the use of very high-level data base languages.

- The same data is represented in incompatible ways

in different files. This presents severe conversion problems or prevents data from being associated as it must be to meet many of management's needs.

- There are many different

versions of similar paperwork in different departments. Each requires different applications programs and maintenance. If the procedures were replanned, they could be similar enough

to use the same programs. To perceive this and plan the solution requires a top-down analysis of data base requirements.

- Much of the logic in today's programs is redundant, with many programmers writing routines that ought to be the same.

- Time-consuming program data coding could be decreased or eliminated with data dictionary techniques. This results in fewer data-related program bugs.

- Most of today's commercial programs are written in languages such as Cobol and PL/I. In typical installations, the rate of program creation varies from seven to 40 lines of code per day.

High-level data base languages permit much faster development of many (but not all) applications. One line of code in such languages is often equivalent to between 10 and 40 Cobol statements.

End-user languages are permitting users to create their own queries and generate their own reports and graphics, provided that appropriate data base facilities are accessible.

Slow and laborious systems analysis procedures can be avoided for certain types of transactions and speeded up for others, if appropriate data bases already exist. Relatively fast analysis of data base events can generate structured English programming specifications or code skeletons of fourth-generation languages (such as Mantis, Nomad, Focus, Ramis, Natural and Ideal).

Good strategic data base planning should aim to attack these areas and maximize future DP productivity.

Corporate Politics

The move to a shared data base environment often worries or antagonizes end users. A user sometimes has to be told that data he has regarded as his own will now have to be shared or derived from a data base maintained by others. The user may regard the data base approach as an invasion of his own carefully protected turf.

Reorganization of procedures or corporate restructuring should often go hand in hand with the data base approach, and that needs senior management involvement.

Often, management or users receive their information from different sources once



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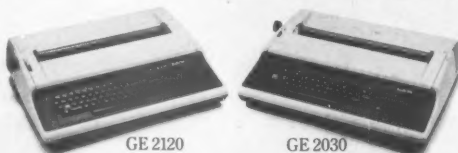
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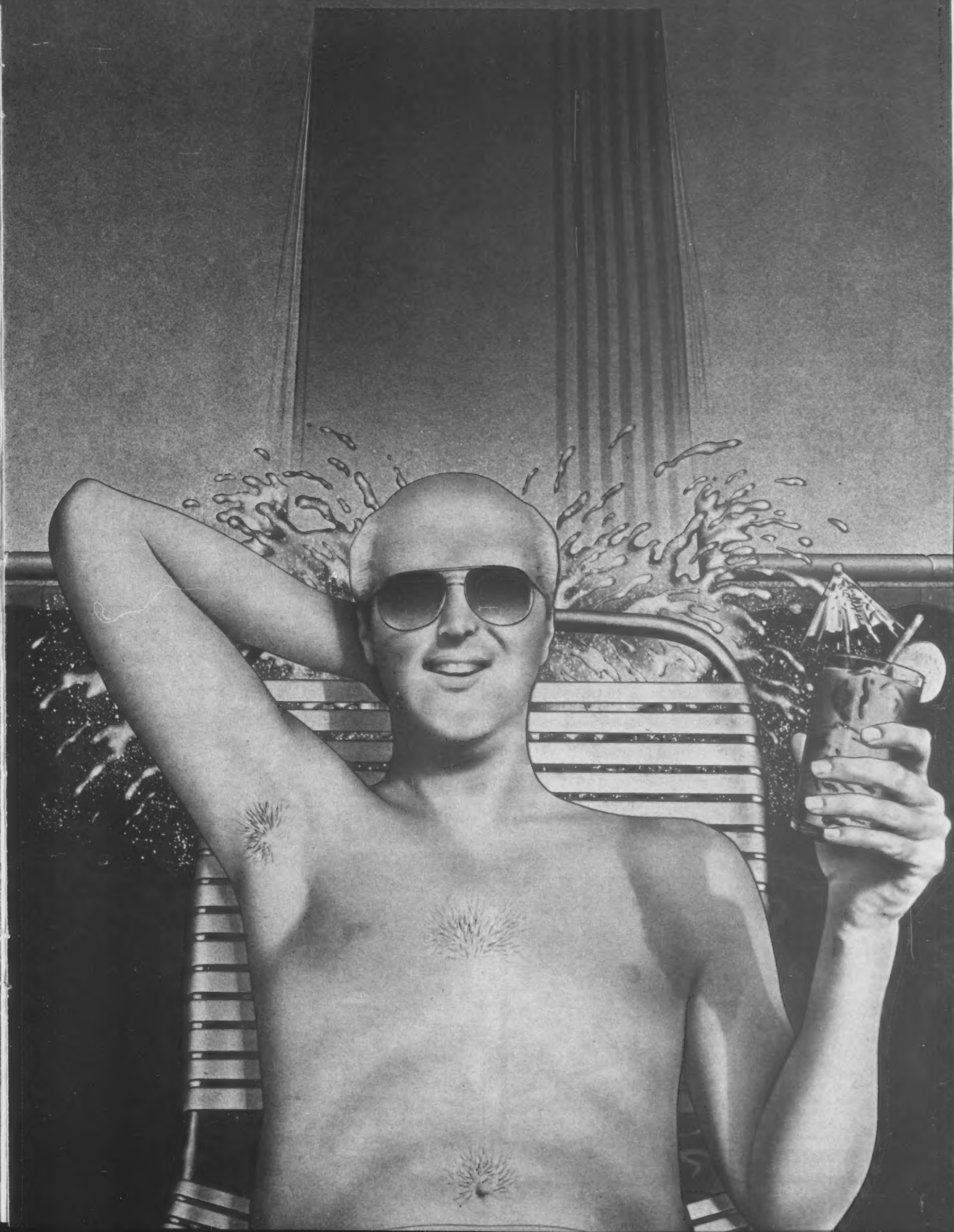
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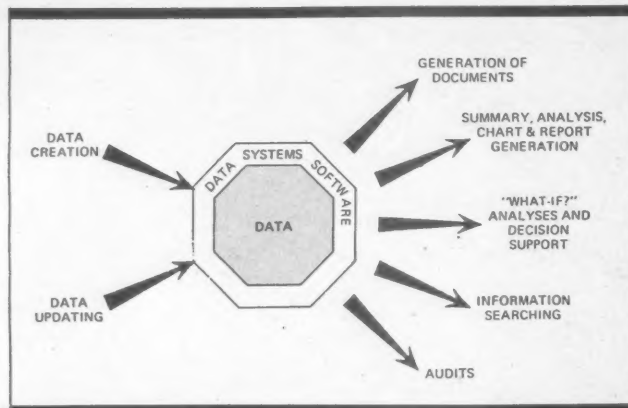
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IN DEPTH



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Figure 1. Most modern DP is composed of events that create and modify data, with appropriate accuracy controls, and processes that use, analyze, summarize and manipulate data or print documents from the data.

the data bases are operational. This may upset long-time employees who used to provide this information.

In many corporations, politics have left the attempt to move to a data base environment in ruins. Throughout the short history of data base, the main reason for failure has been human problems, not technical ones.

There is a world of difference between a situation in which DP is trying to pioneer data base on its own and a situation in which top management understands, endorses and visibly supports the move to data base. It makes a gigantic difference if top management is saying: "We have to build a computerized corporation. That has to be a data base corporation. I want you all to understand that and help as fully as possible."

The emphasis on avoidance of disruptive politics needs to be ongoing because, left alone, disruptions will reassert themselves.

Data Base Charge Back

Another reason for top management involvement is the budget needed for data base development. It is expensive to develop the data

bases a corporation needs. The payoff is a long-term one and the costs should not all be borne by the first applications or the first user department.

If a company is oriented to a long-term planning horizon, it may be ready to accept a data base approach that requires a three- or four-year involvement. If it has a very short-term approach to its business and is trying to squeeze the maximum profit in sales out of every year, anybody who presents a multiyear project is not going to be too well received.

Maximizing return on DP investment in the short term requires different actions from maximizing it over a three- or four-year period.

One of the world's fastest growing computer service corporations developed hundreds of millions of dollars worth of business per year installing customer applications that minimized immediate costs. To achieve this end, the company strictly avoided data base techniques. However, maintenance cost on these applications rose until it was consuming 80% of the service corporation's staff resources. The objective of minimiz-

Data Administrator: We had one accountant who was quite determined not to allow me to dig in and understand what his systems were providing. He felt he could satisfy all the report requirements of his users. It was his prerogative to supply the data in his manner. This gave him some status which I think he was afraid of losing. He's still bent out of shape by the idea of users stepping up to a terminal and gaining access to information he used to provide.

ing immediate DP costs results in high maintenance costs in the long term and prevents the development of data bases that should allow fast, inexpensive application creation when they are complete.

Data base expenditure is a type of cost that ought to be capitalized. Like a major piece of capital equipment, a data base is designed to last for many years. If the designers succeed in creating stable data structures — the objective of canonical data modeling and automated modeling tools — the data base has a life span of at least 10 years and probably more. It will last longer than most major pieces of production machinery. To charge its cost to this year's users does not make sense, especially as it takes some years to develop the applications to utilize data bases fully.

However, there are opportunities to obtain fast payback from data bases in certain applications. When a top-down plan is created, it is desirable to look for those systems with which results can be quickly demonstrated. Often they are systems using high-level data base languages that permit very fast and flexible creation of results.

An important part of strategic planning is to select implementation priorities. A corporatewide view of the needed systems should be developed in such a way that priorities can be rationally set. The subsystems implemented first should be those that solve immediate problems, have fast payoff or are quick and easy to implement.

Several systems with these characteristics can be implemented if they

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Information Engineering

The methodologies for creating data processing systems are changing rapidly. The term "engineering" is used in describing modern methodologies to imply that they use formal disciplines with precise, well-thought-out techniques rather than the invent-it-as-you-go and often sloppy methods of much conventional programming.

The term "software engineering" refers to the set of disciplines used for specifying, designing and programming computer software. "Information engineering" refers to the set of interrelated disciplines that are needed to build a computerized enterprise based on today's data systems. The primary focus of information engineering is the data that is stored and maintained by computers and the information that is distilled from this data. The primary focus of software engineering is the logic that is used in computerized processes.

Software engineering techniques became formalized in the 1970s. They encompass software development methodologies such as structured programming, structured design, structured analysis and tools to support these. They are vital in the creation of complex software with complex logic. In much data processing, however, the design of the logic can be made relatively simple by appropriate data base techniques, but it is complex to create the right data bases and tools for employing them effectively. Different techniques of the 1970s were rarely good enough, and many information systems were inadequate for the needs of corporate management.

Today some corporations have excellent information systems. Information engineering formalizes the techniques by which they were created. It uses different types of diagrams and methods from those used by software engineering.

The basic premise of information engineering is that data lies at the center of modern data processing. This is illustrated in Figure 1. The data is stored and maintained with the aid of various types of data systems software. The processes on the left in the figure create and modify the data. The data must be captured and entered with appropriate accuracy controls and will be updated periodically.

The processes on the right use the data. Routine documents such as invoices, receipts, freight bills and work tickets are printed.

Executives or professionals sometimes search for information. They create summaries or analyses of the data and produce charts and reports. They ask "what-if?" questions and use the data to help them make decisions. Auditors check the data and attempt to ensure that it is not misused.

Data Base Executive: *Our own experience is that management has to get a sense of some immediate payback. So an opportunity to deliver something — and in fact delivering it — is critical. The undertaking should not be so ambitious as to seem mystical.*

The data in Figure 1 may be multiple data systems. It may be stored in different ways and will often be distributed. The data is often updated and used by means of transmission

links and terminals.

A second basic premise of information engineering is that the types of data used in an enterprise do not change very much. An entity is

something about which we store data: for example, customers, parts, employees or machine tools. The entity types do not change during the lifetime of a business except for the occasional (rare) addition of new entity types. The types of attributes that we store about these entities also rarely change.

The values of data change constantly, like the data in a flight information board at an airport, but the structure of the data does not change

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IN DEPTH

much if it was well designed to begin with.

Given a certain collection of data item types, we can find an optimal way to represent them logically. This is the task of the data administrator. The data administrator uses formal techniques (which have been automated) to create stable models of the data. If well designed, these models change little and we can usually avoid changes that are disruptive. In information engineering, these models become a foundation stone on which most computerized procedures are built.

Although the data is relatively stable, the procedures that use the data change fast and frequently. In fact, it is desirable that systems analysts and end users be able to change them frequently. We need maximum flexibility in improving administrative procedures and adapting them to the rapidly changing needs of management. Every business changes dynamically and the views of management on how to run it change much faster.

To summarize, the procedures change rapidly (or should); the computer programs, processes, networks and the hardware change; but the basic types of data are relatively stable.

The foundation stone of data is viable only if the data is correctly identified and structured so that it can be used with the necessary flexibility. This is no simple task. Many of the early attempts to build corporate information systems failed. They are succeeding today where appropriate methodologies are used.

Because the basic data types are stable, whereas procedures tend to change, data-oriented techniques succeed if correctly applied where procedure-oriented techniques have failed. Many of the procedure-oriented techniques have resulted in systems that are slow to implement and difficult to change. Information engineering seeks to fulfill rapidly management's changing needs for information. We can obtain results quickly, once the necessary data infrastructure is established, by using high-level data base languages and application generators.

Figure 2 shows a set of steps that represent the best techniques we know for building data processing systems. The bottom block represents the creation of a model of the enterprise. The enterprise model should reflect future as well as current activities of the enterprise, where these can be anticipated. In creating the model, information sources needed for management should be explored, although they are not currently in use.

The second block in Figure 2 is the strategic data plan. These lower two blocks together form the foundation stones of the computerized corporation. They help to ensure that an integrated set of data systems is built instead of multiple fragments with incompatible data. They also help

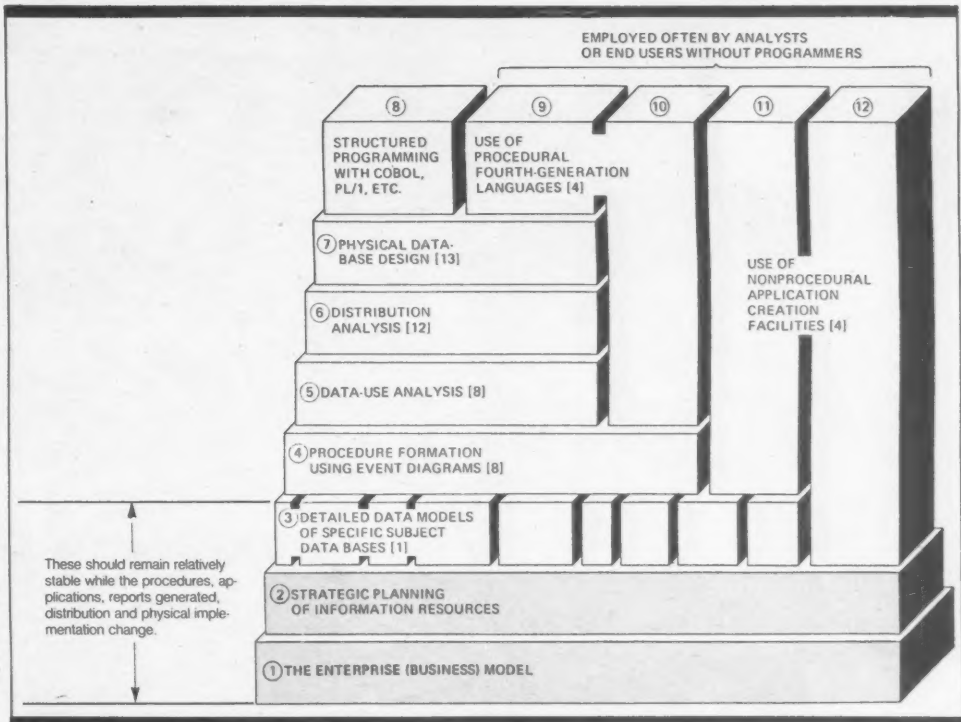


Figure 2. Information Engineering

ensure that the systems meet true management needs. They give top management a plan of action with which to direct the development of information resources.

The third block of Figure 2 is related to the building of stable detailed data models. Different teams may

work on this task, tackling different clusters of entities or subject data bases as determined in step 2.

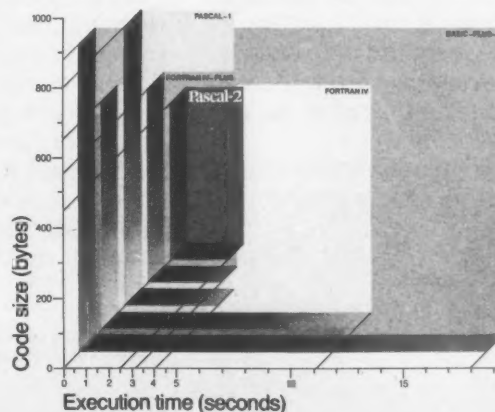
The bottom three blocks of Figure 2 form a foundation on which most future data processing will be built. Once the foundation, or part of it, exists, computer procedures should be

set up as quickly as possible to create and use the data as in Figure 1.

Fourth-generation languages enable computer procedures to be created much more quickly than with third-generation languages such as Cobol or PL/I. Some fourth-generation languages are nonprocedural; in

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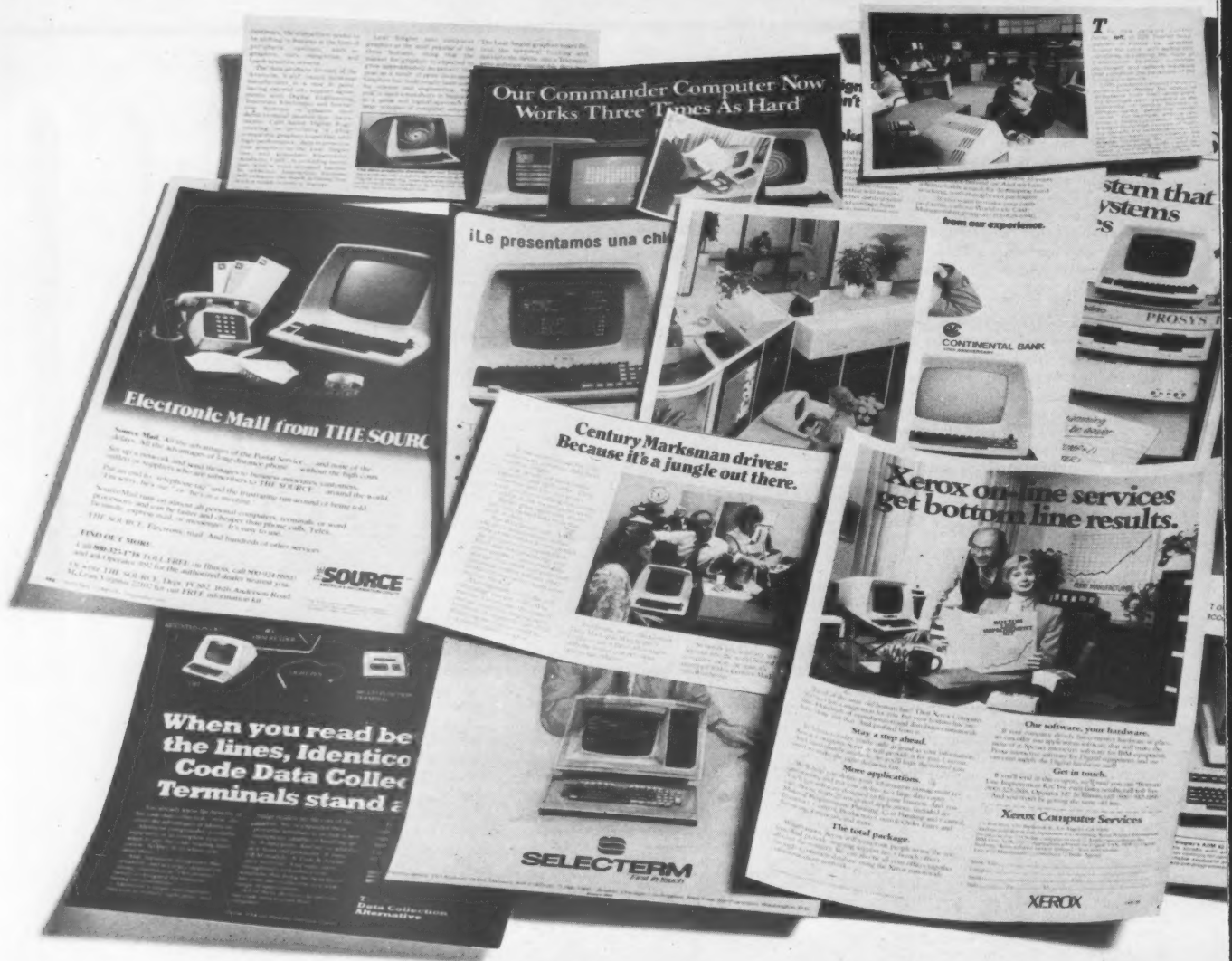
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IN DEPTH

other words, they do not express how to achieve a result step by step. Instead, they express in some easy-to-use way what result is needed, and the system determines how to obtain that result. Blocks 11 and 12 of Figure 2 represent the use of nonprocedural languages.

Some fourth-generation languages are procedural. They are very high-level languages that enable procedures to be created with a much smaller number of lines of code than

with Cobol or PL/I — sometimes one-tenth or fewer lines of code. They are generally much easier to use than Cobol or PL/I but cannot necessarily tackle all the applications in an enterprise.

Both of these types of fourth-generation languages can be so easy to use that users or analysts are tempted to create applications quickly. That is a vitally needed improvement in the DP process, provided that the users do not invent their own data struc-

tures. In many cases, users do exactly that, glad of their own data structures and their newfound liberation from the DP programming organization. Where the data is shared rather than personal, the use of fourth-generation languages should be linked into the data models as represented by blocks 9 and 10 in Figure 2.

To create the procedures that employ a data base, a diagramming technique is needed to represent the events that create data and retrieve,

update or delete data. These event diagrams are easy to make but are drawn in such a way that they can be converted directly into the code skeletons of fourth-generation procedural languages or into structured English specifications for programs written in third-generation languages. This is the basis of block 4 of Figure 2.

Analyzing how the data is used is important for heavy-duty applications (block 5). It leads to decisions about distributing the data (block 6) and physical organization of the data base (block 7). For applications with a low transaction volume, detailed use analysis is not necessary when appropriate data management systems are used. These data management systems may be quite different from the classical data base management systems (Cobasy1, IMS, DL/1, Total and so on).

The computing environment of Figure 2 differs greatly from the old methods of systems analysis. When performed with automated techniques, it greatly enhances the productivity associated with computer use in corporations. It enables the building of systems that can react rapidly to management's computing and information needs. It can greatly lower the costs of DP maintenance.

Data base use can be enhanced and application development speeded up with the addition of another layer to the conventional data base models, called intelligent data base. An intelligent data model contains logic and rules that are generally executed whenever the data is accessed.

Shifting Sands

It is enormously tempting to build data systems without the foundation blocks shown at the bottom of Figure 2. It will become much more tempting as software becomes more powerful and user-friendly.

Most data in an enterprise needs to pass from one department to another. Some needs to be gathered from a number of areas to form the information needed for decision making or control. There are not many types of data for which we can afford uncoordinated random design by local enthusiasts who wish to be left alone.

Strategic data planning, if done efficiently with a proven methodology, does not cost much compared with the hidden costs of chaotic data. It is a one-time expense and, once completed, does not restrict the freedom of local developers. Appropriate data systems greatly enhance corporate freedom to change procedures.

Building modern data processing without the foundation blocks of Figure 2 is like building one's house upon the sand. Sooner or later, it will be in trouble and have to be rebuilt. The absence of the foundation stones of data planning is one of the reasons that so much DP activity bogs down in maintenance. That maintenance is enormously more expensive than planning would have been.†

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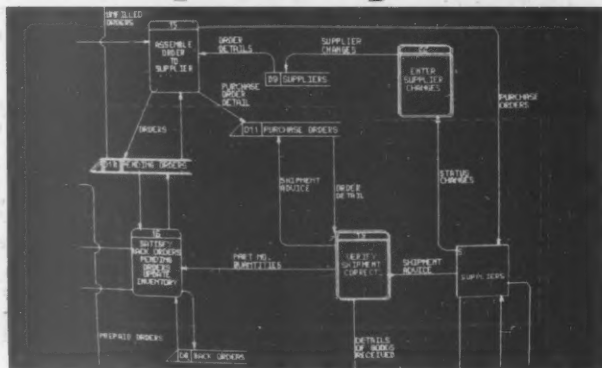
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FT. BELVOIR, Va. — It is estimated that the public spends more than one billion hours every year filling out the forms that are required to satisfy thousands of rules and regulations of federal agencies. When this enormous amount of paperwork is added to the tremendous quantity processed within the government itself, it is obvious that a well-organized data management system is critical. One technology that has contributed to efficient and cost-effective information handling within the U.S. Army as well as many other government agencies is computer output microfilm (COM).

All of the armed forces have been regular users of COM for some time, but their efforts are increasing to reduce the amount of data stored on paper by substituting microfilm output whenever possible. The U.S. Army established a COM program for its Base Operating Information System (Basops).

Basops is an acronym which describes the DP environment that exists at Army installations located within the U.S.

Prior to converting from paper output to microfiche, Basops generated the equivalent of 250,000 pages of data per month per installation. Forty Basops locations in the U.S. were involved in the initial COM program. With each site using an average

of 500 cases of six-part paper each month, these sites were ideal targets for COM. Currently, Basops prints approximately 50% of its financial reports, personnel records, supply and other management report data via COM.

The applications software was developed by the U.S. Army Computer Systems Command (USACSC), headquartered here at Ft. Belvoir. With the COM software designed by USACSC, standard report formats for three of the most widely used information systems were developed, eliminating the need for separate software packages at each site. These three systems produce more than 800 different report products, which satisfy a majority of the Army's regular management report needs.

COM Study

In 1975, the Army initiated a study on the feasibility of COM as an output medium for Basops management reports. Four sites were selected to test both in-house and contract-service COM operations. An analysis of equipment, anticipated volumes and estimated cost savings from the elimination of paper were some of the areas examined prior to reaching a final de-

cision. After extensive discussion, the results were announced and COM was deemed both cost-effective and viable for information management at each of the four sites. The final study concluded that a standard Army COM program should be implemented at all Basops installations.

After approval of the study, the General Services Administration solicited industry, and awards were made to various vendors for micrographics equipment (including a mass procurement for 15 Datagraphix, Inc. COM recorders and duplicators for the in-house sites). In addition, the Army contracted with COM service bureaus to work with some of the Basops posts have lower output volumes. Currently, the majority of the 40 sites operate in-house COM systems and most are utilizing COM equipment manufactured by Datagraphix, a San Diego-based subsidiary of General Dynamics Corp.

The Army cited several reasons as to why
(Continued on Page 60)

'Stor/3000' Runs On IBM 30 Series

WALTHAM, Mass. — Cambex Corp. has announced a new version of its add-in memory system for the IBM 30 series CPUs. The Stor/3000 Version E is a 4M-byte module said to be priced a third less than a comparable IBM add-in system.

The memory system uses 64K bytes of random-access memory for maximum storage density and its address buffer and memory module cards plug directly into the CPU backplane, cohabiting with or replacing the existing memory cards of the IBM system, the vendor said. Version E is available for IBM 3033 Models U, A, M, N and S, with shipments scheduled to begin in October.

The Stor/3000 Version E is priced at \$40,000 from Cambex Corp., 360 Second Ave., Waltham, Mass. 02154.

ICL Adds Desktop To DRS20 Systems

IRVING, Texas — ICL, Inc. has announced an addition to the DRS20 range of local network, microprocessor distributed processing systems.

The DRS20 Model 20 is a stand-alone desktop computer with up to 1.3M bytes of formatted diskette capacity, the company reported. The low-glare video screen features tilt and swivel functions, and the separate keyboard is of a low-profile design.

A communications and printer port are standard. The Model 20 can be connected to the company's Microlan DRS local network, the DRS20 local network and to other DRS20 models. The unit has communications capability with IBM 2780, 3780 and 3276 terminals with 3278.2 emulation.

The Model 20 costs \$6,050, a spokesman said from 415 E. Airport Freeway, Irving, Texas 75062.

CTCA Option Fits IPL 4400 Series

WALTHAM, Mass. — IPL Systems, Inc. has announced a channel-to-channel adapter (CTCA) as an option for IPL 4400 series processors. The device reportedly can also interface with IBM 360, 370 or 4300 series processors.

The unit transfers data between two storage units, either within one processing unit or between two separate processors. In the latter case, the unit can form a loosely coupled multiprocessing system under control of IBM's MVS/Job Entry Subsystem2 (MVS/JES2), MVS/JES3, VM/Pass Through or VM/Remote Spooling Communications System, the vendor said.

The CTCA is a single-board unit powered by a 5V power supply. The unit makes each channel appear as a control unit by using symmetrical logic, the vendor said. When the host processor is powered down, the CTCA is disabled; however, the second processing unit remains free for normal operation.

The CTCA costs \$22,500 and is also available on two-, three-, four- or five-year lease plans, the vendor said from 1370 Main St., Waltham, Mass. 02254.

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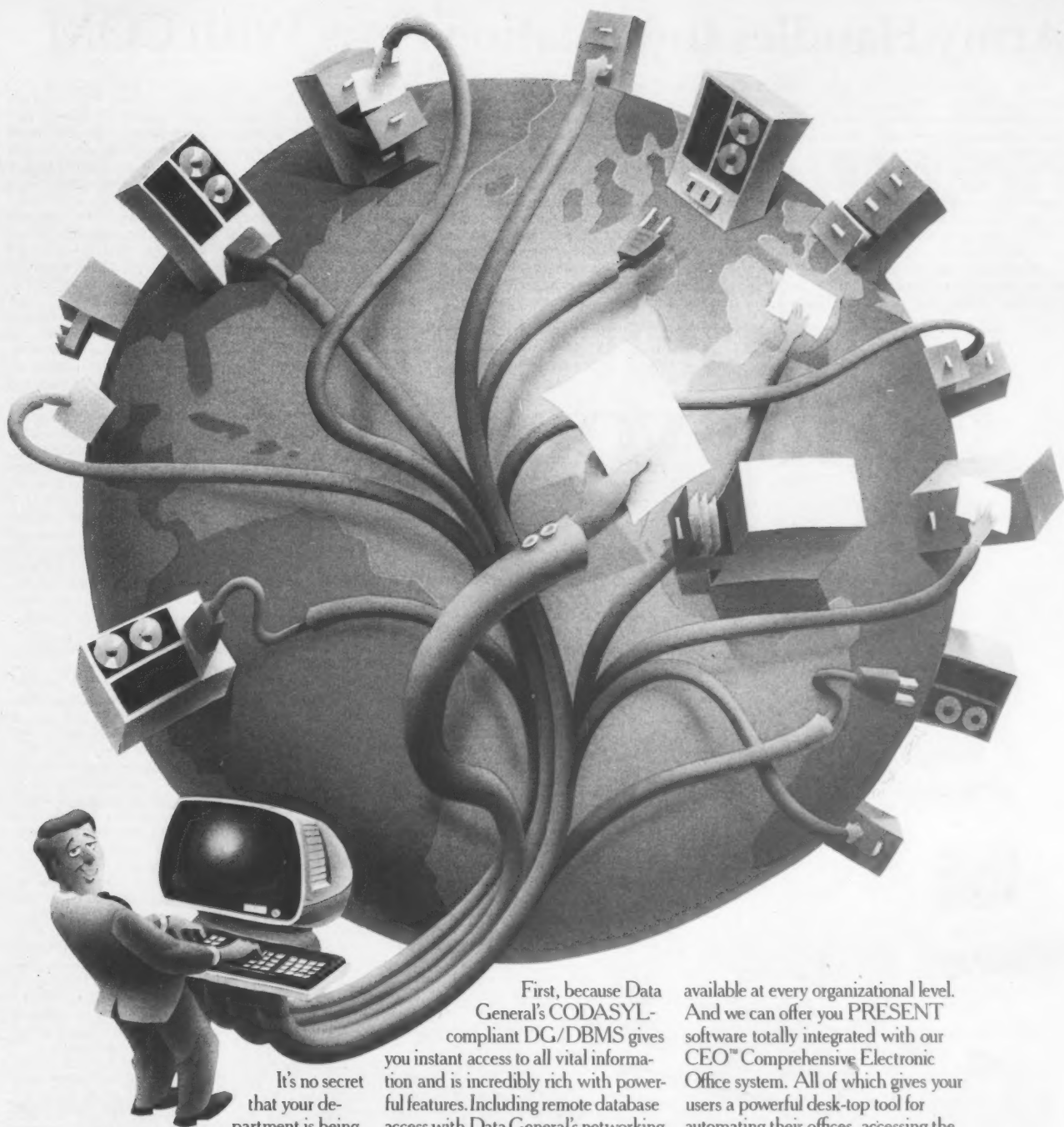
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Army Handles Information Flow With COM

(Continued from Page 57)

COM was chosen as the preferred output medium for so much of its computer-generated data. A major factor was its low cost. Since it is possible to store a great deal of information on one small piece of film, tremendous quantities of paper can be eliminated. With today's high cost of paper products, the savings are significant — in this case, \$10 million a year.

Microfiche is also very easy and inexpensive to distribute. Some DP output is mailed to over 100 locations around the world, and mailing costs for the same data on traditional computer printouts would be prohibitive. The cost of postage for an envelope containing several pieces of film is only a fraction of the cost incurred when sending the equivalent information printed on

paper.

This is especially true in government where information must be kept on file over a long period of time. The use of microfiche, in lieu of paper, dramatically reduces required storage space.

Although the transition to COM output within Basops was relatively smooth, it was not without its problems. As frequently happens, people were accustomed to having

paper in front of them and not everyone was open to the idea of replacing their printouts with this new medium.

Initial Resistance

The Army anticipated that there would be reluctance to the change, so a concerted effort was made to educate the users to the benefits of COM. Once they were made aware of how COM would help them, as well as the Army in

general, the response was very positive. By supplying the users with high-quality microfiche readers, and by displaying clear, precise data on a properly lighted screen, the transition was even smoother.

The Basops COM operation has been a tremendous success. An average of 2,200 masters and 32,000 duplicate microfiche are generated at each installation each month. In addition to the \$10 million a year in cost savings from paper alone, storage requirements have dramatically decreased. Desk tops and office areas which were previously dedicated to holding bulky paper printouts are being used more productively. Much of the valuable time spent searching through reams of paper for required information is no longer needed. Instead, information stored on microfiche is kept within easy reach of the user, and standard titling and indexing of the microfiche make data retrieval a simple and quick process.

Another important factor in utilizing COM output within the Army is the ease and low cost of microfiche duplication. All of the Army's reports require regular updating, some daily, and it is much more preferable to print a new microfiche to replace an outdated one than to replace over 200 pages of printout. The cost of duplicate microfiche is minimal — as low as .04 cents each.

Due to the success of the Basops standardized COM program in the U.S., the Army extended its use of this technology to other locations throughout the world. The expansion began during the summer of 1980 when the Army COM program was extended to installations in Japan, Korea and Europe.

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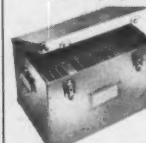
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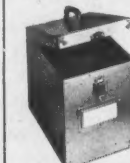


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System Heals State's Disability Claim Burden

(Continued from Page 63)

out before new forms could be printed. In addition, letters produced with the forms were unattractive and hard to read.

Records of cases were also kept manually on 3-in. by 5-in. cards and in strip files. But use of these paper records made data collection and management control time-consuming and difficult, he explained.

To improve operations while eliminating these problems, an investigation was conducted into available systems. Detailed system specifications were prepared to define requirements, including:

- Combined word and data processing capabilities.
- Ease of operation for people with

no previous word or data processing experience.

- Communications capability with other systems.
- Expandability.

All application software is to be supplied by the system vendor to ensure sole responsibility for system operation.

Locally available system service. Six systems were studied and bids were received from four vendors. Based on an analysis of these bids, a Wang VS system was installed because it met all the specification requirements while providing the most cost-effective operation.

Originally consisting of a central processor with 256K bytes of memory, 90M bytes of disk storage, four

CRT workstations and two daisy-wheel printers, the Wang VS system was used to achieve faster operations, increased efficiency and improved management control, Willman stated.

"We've experienced an increase of 25% from 12,000 to 15,000 in the number of claims processed annually since we installed the system," he noted. "Yet we've been able to handle this increased volume with no increase in clerical staff as a result of system operation."

The total time required to process a claim has been significantly reduced to about 38 days. Willman pointed out that the system is one of several factors that have contributed to this reduction in processing time.

"Preparation of correspondence is now more expeditious and efficient. In addition, the appearance of correspondence is improved, making it more attractive and easier to read."

"Basically, we are using the system to do those things that it can do best, eliminating the need for our staff to do tedious work such as data compilation," Willman pointed out. "As a result, based on clerical savings, the system is paying for itself in three years while enabling us to operate with greater speed, efficiency, accuracy and management control."

The Wang system uses word processing software with a visual text processor, reducing the need for operator training to a minimum. Features such as operator prompts and automatic word wraparound assist operators in producing final documents in the most efficient manner possible.

To produce correspondence, operators simply use a CRT workstation to enter codes representing claimant, letter form, medical evidence sources and disability examiner. Letters are automatically printed by daisy printers from data stored in system files. "Stops" are used to further tailor letters if necessary. Follow-up letters are also produced using the same basic procedure.

The system uses data processing software provided by Wang to produce management reports. A file for each claim is set up and data pertaining to the claim such as claimant name and address, date of case filing, decision and other information is entered.

These files are used to automatically produce weekly, monthly and quarterly reports providing information on case status and activities to meet internal and Social Security needs. Ad hoc reports are also produced as required to answer special information requests. In addition, CRT workstations are used to make data inquiries in seconds.

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S-100 System Announced

GARDEN GROVE, Calif. — Advanced Microdigital Corp. has introduced an S-100 microcomputer system said to have unlimited expansion potential. The Super-System uses a master/slave configuration to provide each user with his own dedicated Zilog, Inc. Z80 CPU.

By giving each user his own memory and I/O, the system eliminates the degradation in response times found in other configurations, a vendor spokesman said. In addition, the slave boards provide each user with four serial ports, 2K bytes of erasable programmable read-only memory and 64K bytes of bank-switchable random-access memory.

A 16-user system can be configured for approximately \$15,000 including hard disk drives and multiuser operating software. More information is available from Advanced Microdigital, 12700 B Knott Ave., Garden Grove, Calif. 92641.

System Handles Travel Bookings

RUMSON, N.J. — A computer system designed for small and medium-size group tour and incentive travel operators and said to meet the needs of any company or association arranging meetings, seminars or conventions has been announced by Travel Industry Software Co.

The basic Staff Helper system includes an intelligent CRT terminal, a 120 char./sec printer and a 5M-byte

Expansion Units Fit IBM Micros

LOS ANGELES — Computer Peripherals has announced two memory expansion modules for the IBM Personal Computer that reportedly increase available memory up to 512K bytes.

The PCM1 module allows expansion from 64K- to 128K- and 256K-byte memory. The PCM2 module allows further expansion up to 512K bytes in 256K-, 320K-, 384K- and 512K-byte configurations, a spokesman said.

All memory is addressable as continuous blocks in 64K-byte increments. The system includes an on-board parity error check, bidirectional data buffer and 64K-byte dynamic random-access memory with access time of 150 nsec, the spokesman said.

Full 512K-byte memory expansion costs \$1,400, the spokesman said from 1117 Venice Blvd., Los Angeles, Calif. 90015.

hard disk drive said to handle 4,000 bookings.

The system will automatically match receipts with reservations and produce accounts receivable reports and may be used as a word processor to compile and print mailing labels and letters. Staff Helper, marketed by Automated Travel Systems, sells for \$13,500 from P.O. Box 59, 12 Allen St., Rumson, N.J. 07760.

Stand-Alone Micro

Intersil Releases ISB 80/85

SUNNYVALE, Calif. — A general-purpose, stand-alone microcomputer with standard bus expansion capability has been announced by Intersil Systems, Inc.

The ISB 80/85 comes with a choice of either Zilog, Inc. Z80 or Intel Corp. 8085 CPU cards, a 64K-byte random-access memory card, a 12-in. screen CRT terminal, detachable keyboard and a choice of either two 5¼-in. dual-sided, dual-density floppy disk drives or one 5¼-in. floppy disk

drive and one 10M-byte 5¼-in. Winchester drive, the company said.

A fully integrated operating system based on Digital Research, Inc.'s CP/M 2.2 is supplied along with a standard software package, with optional scientific, business and word processing software packages available, the vendor said.

The ISB 80/85 microcomputer is priced from \$5,990 to \$8,990, depending on storage requirements, from Intersil Systems, 1275 Hammerwood Ave., Sunnyvale, Calif. 94086.

Quasar Unveils Expansion Units

CLEVELAND — Two storage expansion units reportedly featuring a 5¼-in. micro Winchester hard disk drive with controller and power supply have been introduced by Quasar Data Products.

Both the HD-10 and HD-15 units provide a formatted capacity of 10 or 15M bytes with a transfer rate of 5M bit/sec to the S-100 bus and a track-to-track access time of 2 msec.

The units also feature IEEE-696 compatibility, front-panel drive status indicators, modular construction and S-100 bus compatibility.

The HD-10 is priced at \$3,995 and the HD-15 at \$4,995 from Quasar Data Products, 10330 Brecksville Road, Cleveland, Ohio 44141.

RAM Cards Fit Apple II Micro

STAMFORD, Conn. — U-Microcomputers, Inc. has announced a line of random-access memory cards for the Apple Computer, Inc. Apple II processor.

They are available in 16K-, 32K-, 64K- and 128K-byte configurations, and users can use as many memory expansion cards as there are free slots in the processor backplane. This offers a typical maximum of 566K bytes of storage, the vendor said.

The 16K-byte card costs \$90, the 32K-byte card costs \$140, the 64K-byte card costs \$240 and the 128K-byte version costs \$380. The cards are available from U-Microcomputers, Inc. at 300 Broad St., Stamford, Conn. 06901.

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OA

Computerworld OA's fourth and final issue for 1982 will focus on how to select the best technology and equipment for the user's current applications and future needs. This report will include product evaluations, comparisons and tutorials regarding local area networks, PBX systems, electronic mail, stand-alone or clustered word processing systems, professional workstations, graphics, voice and image systems . . . just to name a few.

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To Deliver to Users

MIS Execs Urged to Develop Plan for OA

By Marcia Blumenthal
CW Staff

CHICAGO — The management information systems (MIS) departments of firms should "grab onto" office automation and come up with a new way of delivering OA to users, a

speaker at the recent Society for Management Information Systems conference advised.

Users resist turning to the MIS department because they often see it as a significant bureaucracy within the organization, according to Jerrold J. Eisen, pres-

ident of Office Sciences International, Inc. Eisen urged MIS executives to begin developing a strategic plan for OA even though the technology for OA is not fully in place. Based upon the response from the audience attending Eisen's pre-

sentation, the majority of MIS directors have responsibility for OA within their companies.

To date, MIS departments have approached OA on a situation-by-situation basis rather than as a strategic problem, he observed. One reason for this is that OA has so far presented no "visible pain if it didn't work." OA technology is not yet embedded into the corporate structure and the cost threshold has not yet become high enough to warrant strategic planning action, he said. And until recently, MIS departments have not been terribly interested in OA.

The Time Has Come

However, the time has come for MIS departments to become leaders in establishing OA within the corporation and providing users with the tools to manage the rewards promised by the technology, he said.

Users have to be won over to the idea of MIS professionals managing OA. "There is a changed culture in the corporate user community. They are willing to use the tools and will accept help from MIS, but they are not willing to accept direction if MIS professionals approach OA in the same manner they have for DP — by fiat," Eisen maintained.

What the MIS department has to do is provide the "platforms" for launching OA. These platforms include local-area networks and access and sharing of data bases. "The office will be driven by how effectively the platforms are brought to users," he said.

Office workers, not clerical staff, operate in a highly unstructured environment, using information that is scattered throughout the organization. Because of this fragmentation, tools cannot be given to users on a hit-or-miss basis, Eisen argued. The strategic plan must contain a method of getting information dispersed to users.

The MIS department must deliver not only the appropriate tools to workers but must also provide those tools in sufficient

(Continued on Page 68)

But Lack Some Functions Now

Study: Micros Seen Replacing 3270s

By Jim Bartimo
CW Staff

FRAMINGHAM, Mass. — Perhaps in anticipation of IBM's recent announcement of 3270 emulation for IBM's Personal Computer [CW, Sept. 20], respondents to a study conducted by International Data Corp. (IDC) here believed that 3270-type terminals will be replaced by personal computers or a device that is both a 3270 and a personal computer.

A few respondents predicted that such a device could be available within one to two years, the study said.

The study, *Personal/Desktop Computers in Large Organizations*, said, "At the present time, there is a significant function capacity that the respondents felt they receive in the 3270 that the personal computers do not provide. The two most important parts of this are in the areas of communication and full-screen editing."

However, this is expected to change as personal computers — especially the new 16-bit machines — are given communications protocols such as Systems Network Architecture (SNA), System Data Link Control (SDLC) and 3270, the study said.

As they proliferate in organizations, personal computers will be communicating with the mainframe, so close attention must be paid to communications protocols, especially IBM's SNA. Because there is no clear protocol trend as yet, the management information systems (MIS) department should keep communications standards flexible, respondents

said, but most users would prefer to have SNA/SDLC for personal computers in the organization.

Local Nets Ranked Second

Local-area networks ranked second in importance among users surveyed who believed that it is more important for personal computers to communicate with the mainframe than to communicate with each other. While many respondents did not see a clear need for local-area networks, most felt that personal computers would be part of a local-area network that includes other devices.

On the subject of remote data base access with personal computers, such as the service offered by Dow Jones & Co., respondents indicated that this is not part of the MIS budget and should therefore be paid for by the end user. Indicating that modems will be commonplace at some point, one respondent suggested that a dial-up data

base could be implemented to replace interoffice mail.

The integration of word and data processing is considered to be a pending reality by users interviewed in the study. Personal computers will play some role in this integration, but users do not feel that it is capable of replacing word processing equipment in its present form, the study said.

Many large organizations responded negatively to the idea of the personal computer entering office automation as a viable entity right now although they recognize that it has a place in the office. "Certain respondents recognize the personal computer as a possible bridge between the word processing equipment and the computer equipment," the study said.

Personal/Desktop Computers in Large Organizations is available to non-IDC clients for \$4,500 from IDC, 5 Speen St., Framingham, Mass. 01701.

Local Net Ties Typewriters To Transmission Devices

BOSTON — T.H.E. Data Transfer Corp. has introduced a local-area network that reportedly will accept noncommunicating office typewriters. The network is said to integrate dissimilar items of text and data preparation equipment with data transmission devices and peripherals.

In addition to accepting ordinary typewriters, Linc will accept electronic memory typewriters, word processors, key

terminals and hard-copy terminals. Output can be delivered to computer mainframes, message switches, word processors, printers and multiport communications terminals, a vendor spokesman said.

The network is available for between \$7,595 and \$15,000, depending on the device to be configured. More information is available from T.H.E. Data Transfer Corp., 52 Church St., Boston, Mass. 02116.

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Desktop Facsimile Capable Of Sending Page in 20 Sec

DETROIT — A desktop facsimile said to offer a compatibility range wider than any other facsimile and to be capable of transmitting a page in 20 sec has been announced by Burroughs Corp.

The DEX 3500 features a thermal head printer and electronic circuitry that automatically adjusts to resolution, contrast and color variations of the original to

produce clear copies.

Operating in the digital mode, the DEX 3500 reportedly transmits documents as small as 5-in. by 5-in. and as large as 8½-in. by 328 ft during a single phone call.

The DEX 3500 is priced from \$4,955 to \$5,995 with lease arrangements offered from Burroughs Corp., Burroughs Place, Detroit, Mich. 48232.

WP Package Fits System/38; Little Impact on Resources

JACKSON, Mich. — Alro Computer Software Services has introduced a word processing package for use on the IBM System/38 said to have minimum impact on the system's resources.

Easy-Word/38 reportedly features full security to ensure that users can access only documents that

they are authorized to use. It is a full-feature word processing system, a vendor spokesman said.

The word processing package is available for \$499. More information is available from Alro Computer Software Services through P.O. Box 927, 3100 E. High St., Jackson, Mich. 49204.

Micro Users Get WP Book

CHERRY HILL, N.J. — Management Information Corp. has introduced a guide to word processing systems for business microcomputer users.

Spotlight on Word Processing provides evaluations for these systems, including: IBM's Displaywriter, Wang Laboratories, Inc.'s Wangwriter, Micropro International Corp.'s Wordstar and Radio Shack's Scriptsit.

The guide is available for \$89.50 from Management Information, 140 Barclay Center, Cherry Hill, N.J. 08034.

MIS Execs Urged To Plan for OA

(Continued from Page 67)

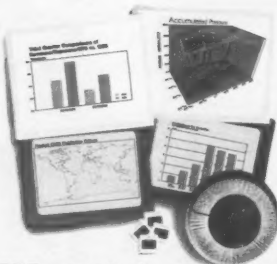
quantities. "How many people in the organization are becoming quasi-programmers because help isn't there?" he said.

The information center approach is a promising method for doing this, he added.

And, in getting applications out to users, analysts do not have to use such stringent development criteria as they have had to do with large, corporatewide systems. "Let new applications be tried and allow for failure," he noted.

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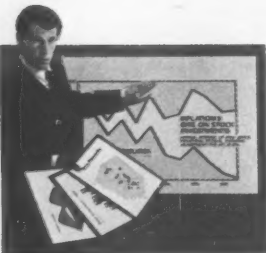
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Prime Unveils Mini, First CRT Terminal

By Paul Gillin
CW Staff

NATICK, Mass. — Affirming a company goal to become a "complete systems supplier," Prime Computer, Inc. late last month became the most recent minicomputer maker to start manufacturing terminal products.

The Prime System Terminal Model 100 (PST100), announced in tandem with the low-end, 32-bit Prime 2250 minicomputer, [CW, Sept. 27] is a calculated first step toward "backward integration" of the Prime product line, a company spokesman said.

The nonprogrammable PST100 reportedly offers minor ergonomic improvements over the PT 45 terminal that Prime buys on an OEM basis from Beehive International and markets with its packaged systems.

But more importantly, it sets the scene for downward product line expansion into intelligent terminals. "The PST100 uses the same technology needed for a programmable terminal," said Ian R.G. Edmonds, Prime vice-president of plans and programs. He hinted that Prime may manufacture such a terminal in the not-too-distant future.

"There is a clear trend in the industry toward putting more computing power in the hands of the end user," Edmonds said. "The introduction of the PST100 is our formal recognition of that fact."

"Terminals have always been a small percentage of our market, but Prime has reached the size that we are generating a large number of ports for people to connect terminals into our systems," he said.

The new offering will supplant the PT 45 terminals which the company has marketed with its systems since 1979.

The PST100 will initially be manufactured at Prime's Natick, Mass. facility, with expansion possible into facilities located in Puerto Rico and Ireland. Edmonds said the Prime work force will not be significantly affected, since a "substantial surplus" already exists in the factory.

Users can expect a plum in the form of lower prices for the PST100. At \$1,595 for a single terminal, the product sells for about \$400 less than the PT 45.

(Continued on Page 71)

Microchip Vendors Plan Local-Net Controllers

By Jim Bartimo
CW Staff

At least two microchip vendors are planning to introduce, by the end of this year, communications controller devices that are expected to lower the cost of local-area network implementation. Through very large-scale integration (VLSI) technology, these controller chips reportedly will link devices together within a baseband local-area network and are expected by some vendors to unlock the floodgates of hesitant buyers.

By shrinking down the communications controller hardware, the chips will reduce the cost of local-area networking by as much as 20%, according to Charlie Bass, vice-president of Ungerman-Bass, Inc., a vendor of local-area networks.

"Fujitsu will be taking the chips to market by the end of the year," Bass said. Bass' company has successfully configured Fujitsu's two chips to produce a Xerox Corp. Ethernet-compatible interface, according to Bass.

A number of semiconductor manufactur-

ers are testing the network chip market including Intel Corp., Mostek Corp., National Semiconductor Corp. and Advanced Micro Devices, Inc., according to John White, president of the Destek Group, a local-area network vendor. "They're all in communication protocol chips," he said, "There's a lot of activity in VLSI."

Intel Chips Out in Europe

Containing more than 50,000 transistors, Intel's chips have already been introduced in Europe and will be introduced in the U.S. as early as next month, according to Charles Bishop, marketing manager for the Ethernet Systems Group at Intel. "We're coming out with a set of two chips for carrier-sense multiple access with collision detect (CSMA/CD) and serial interface," he said.

Joining the fray, IBM and Texas Instruments, Inc. have made a joint development agreement for VLSI chips. These chips will be mountable on a printed circuit card for use in a token-passing local-

(Continued on Page 72)

Major Goals for 1980s

Democrats Set High-Tech Goals

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — Democrats in the House of Representatives unveiled late last month a long-term economic policy that calls for increased research and development and greater investment in new technologies as major goals for the U.S. in the 1980s.

Issued as the Democrats' answer to Reaganomics, the program notes the emergence of an information/services-based economy in this country and suggests ways to manage the transition to that new economic reality. The U.S. is entering "a generation of fundamental change," according to the document, which cited the "technological revolution" of advanced

high technology, particularly computers, and related new markets and industries.

The economic policy paper is one of seven developed over a 20-month period by a committee of the House Democratic Caucus, the organization of all Democrats in the House. The other policy statements, covering various topics such as small business, housing, crime and national security, also point to a need to address changes in the U.S. brought about by emerging new technologies.

Developed to counter arguments that the Democrats have done little but denounce presidential initiatives while offering nothing constructive of their own during the Reagan administration, the "Democratic directions for the 1980s" document is important because it indicates a long-term direction for that party's legislative efforts. The document is a consensus of a wide political spectrum of House members and was drafted primarily by young congressmen, who can be expected to supply the House leadership for many years to come.

The economic policy development effort, for example, was chaired by Rep. Tim Wirth (D-Colo.), who has spearheaded the House effort to redraft U.S. telecommunications law during this Congress and is considered one of the young lions of congressional Democrats.

New Era for Democrats

Wirth said the economic paper represents "the beginning of a new era for the Democratic Party." Rejecting the Republican call for less government, Wirth said that the Democrats "are not ashamed to say government has the responsibility to play a leadership role in easing our transition from a manufacturing-based economy to one that is increasingly involved in technology, information and services."

Calling for revamped income and business tax laws, the economic plan proposes to reverse the decline in R&D expenditures in the U.S. by, among other things:

(Continued on Page 71)

CSC Sues Tennessee, EDSF For \$83 Million in Damages

By Bill Laberis
CW Staff

NASHVILLE, Tenn. — The execution of the state's Medicaid service contract has deteriorated into an ugly scene with a California computer service company filing an \$83 million civil suit against the state and the vendor who formerly held the contract.

In addition, Computer Sciences Corp. (CSC) sought injunctive relief in U.S. District Court here to enjoin the state from terminating the company's \$25 million Medicaid contract. Federal Judge John T. Nixon, however, denied CSC's request last week, ruling that the state did not deny the company due process in canceling the Medicaid contract.

The state terminated its Medicaid contract with CSC in August, just nine months into a five-year agreement. The action reportedly followed progress reports of an independent auditor that claimed CSC was experiencing continuous problems servicing the contract, including

overpayments of about \$7 million to various health care providers.

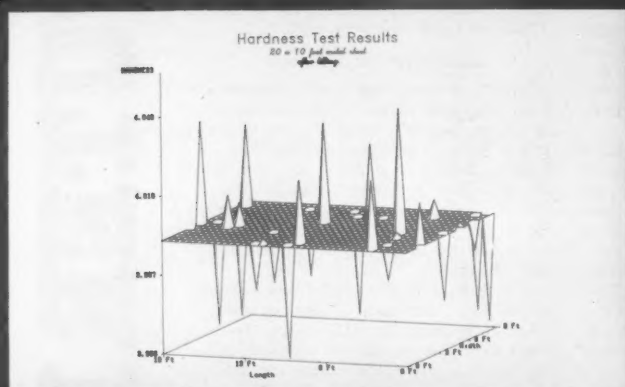
The contract cancellation was to be effective Sept. 30, when the state planned to enter into a 21-month temporary Medicaid contract with Electronic Data Systems Federal Corp. (EDSF) of Dallas. EDSF held the Medicaid contract for five years prior to Jan. 1, but lost it to CSC in competitive bidding.

Damages Sought by CSC

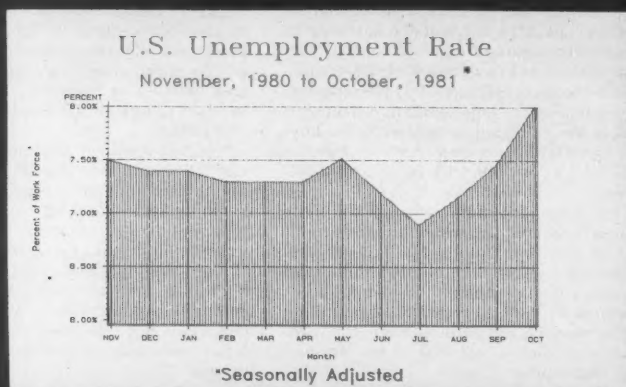
The damages sought by CSC, according to a company spokesman, include: \$10 million from various state and federal health officials and from EDSF for "intentional interference with contract performance," \$30 million from EDSF upon proof of the first claim, \$1 million from each of three state public health officials, \$30 million treble damages from EDSF "for inducing the state to breach its contract with CSC" and \$10 million from three state officials for "breach of constitu-

(Continued on Page 73)

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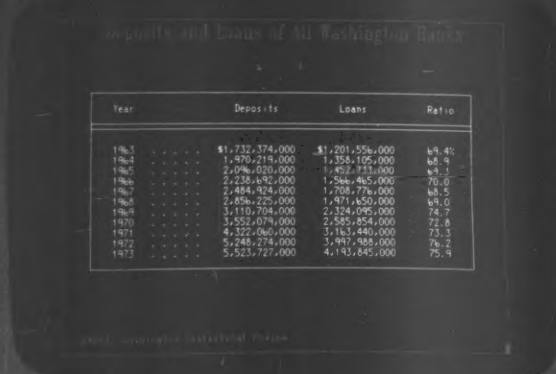


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Democrats Unveil High-Tech Plan

(Continued from Page 69)

- Establishing a national goal of a 3% annual commitment of gross national product to R&D, with special emphasis on federal financing of long-term basic research.
- Providing incentives to "entrepreneurs who engage in high-yield but risky R&D projects."
- Enhancing the influence of the president's science adviser.
- Providing initiatives to "help disseminate the benefits of new technologies

through a variety of programs, possibly including a "robot-leasing program" for U.S. industries.

Manpower development and education and retraining programs for U.S. workers are also highlighted in the Democratic action plan. The economic blueprint suggests several approaches for "brainpower" development, including:

- A national commitment that no qualified student be denied the chance for a college education for lack of the

ability to pay.

- Developing steps to increase the supply of junior faculty in computer science and electrical engineering through new public/private efforts to make faculty salaries competitive.
- Extending into higher education the new emphasis on broad computer literacy.

The plan also notes a need for better elementary and secondary education programs to develop work force skills equal to the rapidly changing economy.

Prime Introduces Terminal, Mini

(Continued from Page 69)

Hardware improvements in the PST100 include a tilt-and-swivel display, high-resolution screen with graphics capability and a redesigned selectric-style keyboard layout.

Software utilities include the Prime Source-Level Debugger, the Emacs full-screen text editor and the Forms Management System for interactive screen formatting. Transfer protocols were designed to optimize compatibility with Primos operating system software, a spokesman said. The product also includes intelligence capabilities that will be compatible with future generations of software products.

The development and retooling costs for the PST100, which has been on the

boards for about two years, will be offset by higher anticipated sales volumes, Edmonds said, adding "Our shipment targets are quite a bit higher than those for the PT 45s."

Prime President and Chief Executive Officer Joseph M. Henson said that Prime will continue to market the PT 45, but that, "Volumes will be gradually reduced." The company will continue to market the PT 65 intelligent terminal, which it purchases on an OEM basis, Henson said.

Rosy Future Seen

A spokesman for Beehive acknowledged that the Prime product will reduce his company's volumes, but predicted a rosy future relationship with Prime. "Classi-

cally, the introduction of a product doesn't mean the end of business with that company," said John McPhail, vice-president of marketing and sales for Beehive.

McPhail said that the Prime announcement is contrary to what he sees as an industry trend away from integration. "Many companies discover that building a versatile terminal isn't as easy as it looks on the surface," he said. "There is so much specialization in the field that a company needs a lot of expertise to develop a terminal properly. Our market is growing."

McPhail said he expects his company's status as an OEM vendor to Prime to continue through 1983. "Prime will be a vendor of our terminals for a long time to come," he said.

Shugart Reorganizes

SUNNYVALE, Calif. — Shugart Associates, Inc. reorganized and laid off 125 salaried employees last month.

The maker of disk storage products has decentralized into five divisions and formed a central corporate staff consisting of four groups, according to James Campbell, president of Shugart.

Campbell said the reorganization was implemented to increase management accountability and eliminate duplication of effort. Shugart employs approximately 3,500 people.

The new vice-presidents/general managers and their divisions are as follows: Thomas Gardner, Rigid Disk Drive Division; Carl Neun, Floppy Disk Drive Division; Paul Penney, Sunnyvale Division; George Sollman, Marketing and Sales Division; and Peter Lloyd, Optimum Division.

Shugart's corporate staff vice-presidents and their respective groups are: Thomas Gilmer, Quality; Robert Bledsoe, Finance and Planning; Christopher Carlton, Personnel and Administration; and Michael Feldstein, Technology.

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Commission on Civil Rights Tech Firms Told to Beef Up Minority Visibility

By Robert Batt

CW West Coast Bureau

SAN JOSE, Calif. — High-technology companies should place greater emphasis on increasing the number and visibility of minority group engineers, the U.S. Commission on Civil Rights was told here recently.

In testimony before the Commission, Raymond Landis, director of the minority engineering program at California State University, claimed that companies compete for a small pool of black and Hispanic engineers when what is needed is to expand the pool itself.

The commission, which subpoenaed 45 witnesses from the high-

technology industry, financial institutions, the education sphere and government, is examining the extent to which minorities and women are participating in business development and employment opportunities presented by high-technology industries. Its findings will be published in a report to be presented to the President, Congress and various federal and state agencies.

In a session focusing on career directions, Bruce Hamlett, education specialist for the California Postsecondary Education Commission, claimed that by the mid-1990s, minority groups and women will comprise the majority of the student pop-

ulation in the U.S. "We have to make substantial changes over the next decade to prepare minority students for higher education. State and federal government have to work a whole lot more effectively in this field in the future than they have done in the past," he warned.

Concentrating on future strategies for educating students in high-technology disciplines, Elizabeth Stage of the Equals Program at the University of California, Berkeley, said universities and high-tech companies need to work with teachers to provide them with strategies for guiding their students in career paths. She also called for more funding and

support for education models that have been tried and tested.

The commission's hearings came after a recently published report by the California Commission on Industrial Innovation (CW, Sept. 27), which warned that unless the nation invests in new technology education programs, the U.S. will suffer continued declines in productivity.

Testifying before the Civil Rights Commission, Robert Finnell, executive director of the Mathematics, Engineering and Science Achievement Program at the University of California, Berkeley, asserted that within 10 years the U.S. will need three times as many junior high school students studying math and science subjects as it has now. "For this to happen we need to build on the coalitions who are interested in women and minority group progress including industry and the academic community," he added.

Many witnesses emphasized the need to create an expectation of success in minority students.

The urgency of such developments was emphasized during testimony. George Castro, founding member of the Coalition for Latinos in Engineering and Science, claimed: "Silicon Valley is going to become more and more a research and development center. Kids need to have some kind of high-technology background if they are going to continue to live here. So far, very few Latinos have managed to enter the management ranks and it is clear they have not been as successful as the population as a whole."

VLSI Tech Cuts Net Costs

(Continued from Page 69)

area network, said William N. Sick, executive vice-president and manager of TI's Semiconductor Group.

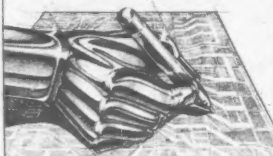
Local-area network vendors and chip manufacturers alike expect this new technology to lure the buyer into a second look at networking. "We're seeing two things fueling the market: the IEEE 802's [Committee on Local-Area Network Standards] switch to an Ethernet standard and VLSI chips," Bishop said. These two things will allow people to start building local-area networks. We expect a great deal of activity."

But costs will only be cut if the semiconductor manufacturers find a large market for the chips, White pointed out. In other words, if the networking chip trend convinces more buyers to purchase them, the cost will decrease accordingly. Pointing to hand calculators, which are driven by microchips, White said, "Microprocessors would still be \$95 if people didn't buy a million of them."

In addition to the price reductions projected with VLSI chips, performance is also expected to be improved. Bishop expects internal functions — once based in the software — will be more complete when placed in the hardware.

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Few Women, Minorities Study DP: Report

By Robert Batt

CW West Coast Bureau

MOUNTAIN VIEW, Calif. — Women and minority groups will be left behind in the push to upgrade technical and scientific education if present trends continue, according to a report published here recently.

The "Background Report on Silicon Valley" was prepared for the U.S. Commission on Civil Rights by the Pacific Studies Center. The 98-page report says that of the 16,000 computer specialists who graduated from U.S. schools between 1978 and 1980, 73% were male and just 27% were female. Furthermore, the report points out, of these graduates less than 12% came from ethnic minority populations.

"Except for Asian-American men, most engineering and science graduates are still white males. Women and blacks appear to make up their largest shares in computer specialties, but they still represent a fraction of the graduates," the report adds.

Although industry and the state have recommended that the state universities train guidance counselors to encourage students, especially women and minorities, to take math, science and computer courses, the report warns that public expenditure cutbacks are forcing school districts to downgrade their counseling programs.

The report says that while Silicon Valley's community colleges have ac-

tive programs in high-technology education and several teach about 1,000 students each in electronics and computers each year, they barely scratch the surface of industry's need for vocational training.

Nevertheless, the report points to some encouraging developments. Foothill College, for instance, is the only institution in the country to offer an A.S. degree in semiconductor processing, while West Valley College has just installed an IBM 4331 computer to train business students and a Hewlett-Packard Co. HP 1000 to train programmers.

Silicon Valley, as the cradle for hundreds of high-tech manufacturing and computer service firms, could be a model for business development nationwide, the report states. The Valley has at least 800 manufacturing firms with more than 10 employees and nearly 2,000 business sites for manufacturing and service companies with less than 10 employees. "However, as in the other parts of the nation, there are few high-tech firms owned by minorities or women."

"Since most Silicon Valley companies were formed as spin-offs of other firms by scientific and engineering professionals who are predominantly white males, most top managers are white men as well. Although some women occupy management positions in personnel, marketing and public relations, only a handful of women sit on Silicon Val-

ley boards of directors," the report adds.

The Pacific Studies Center claims that a major obstacle to minority- and female-owned business formation in the region are the barriers to advancement in established companies. There are few women or Hispanic engineers, says the report, so there are few electronic firms that have been formed by these groups.

It adds: "Since software design is the professional field most open to women and minorities at large companies, it is not surprising that there are a number of small programming firms run by women and minorities who formerly worked for industry leaders. In building anything larger, the chief problem faced by minority and female-owned businesses is their inability to attract sufficient capital."

CSC Sues California, EDSF

(Continued from Page 69)

tional rights," for a total of \$83 million in compensatory and punitive damages.

In a letter to Tennessee Public Health Commissioner Dr. Eugene Fowinkle, CSC President Ross Fomcrook said that his company will refuse "to participate in a turnover phase" of Medicaid operations to EDSF, further complicating an already bad situation, according to state officials.

Meanwhile, even though the company is pressing forward with its mammoth suit, CSC has prepared a counterproposal to the award of a temporary contract to EDSF. State Assistant Attorney General William Hubbard said that the state is "still open to discussion" with CSC on the merits of its counteroffer.

'Pertinent Facts Ignored'

According to CSC spokesman Bruce Plowman, the state's decision to terminate the Medicaid contract was made "in an emotionally charged atmosphere . . . where pertinent facts were ignored."

In its counteroffer to the state, CSC has proposed to pay the state the estimated \$2 million in overpayments not yet recovered. Plowman said that CSC would recoup this money later as it recovers the overpayments.

CSC also offered to raise to \$5,000 the daily penalty should it experience a greater than 2% error rate in processing Medicaid claims.

Plowman did not deny that the company has experienced problems in servicing the contract to process the eight million annually submitted

claims of 320,000 Medicaid recipients. The problems, he offered, are not uncommon to any service company in the first contract year.

Laying a good part of the blame for the problems squarely on EDSF, Plowman said, "During the transition [when CSC assumed the contract] we got bad data, late data, data from other states."

About the two damaging auditors' reports, Plowman said the first one, analyzing CSC's performance over the first five months of the contract, "led to emotional and inaccurate analyses of our performance." The company was then not given adequate time to respond to the second report, based on CSC's subsequent performance, Plowman added.

CSC has demanded a copy of the state's interim agreement with EDSF, claiming the agreement will cost taxpayers substantially more than the contract with CSC. As per the interim agreement, Tennessee will pay EDSF 49 cents per claim, the same as CSC was paid, plus \$420,000 in implementation costs.

Like its rival in the matter, EDSF is no stranger to alleged start-up problems in servicing public health contracts. Last month the Federal Health Care Financing Administration in Illinois decided not to renew its \$41.2 million Medicare contract with EDSF after considering allegations the company was not servicing claims promptly.

EDSF reportedly experienced similar start-up problems in Texas last year in setting up a program to handle Blue Cross/Blue Shield claims there.

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House OKs Micro-to-Schools Bill, Prompted by Apple Donation Offer

WASHINGTON, D.C. — Legislation to promote personal computer equipment donations to elementary and secondary schools, a bill prompted by a multimillion-dollar Apple Computer, Inc. donation offer, won easy approval in the House of Representatives late last month.

The bill, which still must be approved by the Senate, would grant manufacturers a special tax deduction that exceeds the cost of producing the donated equipment during a one-year period, 1983. The legislation, which will cost the U.S. Treasury an estimated \$15 million in 1983 and \$21 million in

1984, faced some opposition because of its special-interest nature, but had 86 House cosponsors and passed by a 323 to 47 vote Sept. 22.

The bill contains provisions meant to ensure that manufacturers do not dump unsold or obsolete inventory on schools and do not limit their donations to schools in certain geographic or high-income areas. Apple has offered to donate computers to 75,000 schools, according to the bill's sponsors, which will extend tax breaks now available for donations of scientific equipment to colleges [CW, March 8] to Apple and other microcomputer makers.

House Bill Would Create Reindustrialization Body

WASHINGTON, D.C. — Legislation was recently introduced in the House of Representatives to create a special congressional committee on reindustrialization which, among other things, would investigate technical and scientific manpower needs in the U.S. and the problems of introducing high technology into American industry.

The "select committee on reindustrialization," proposed in the Sept. 16 House resolution, would create a 27-member group of congressmen which would, by the end of 1983, develop legislation addressing a number of issues.

Included in the commission's in-

quiry would be: whether capital markets generate sufficient investment, what education programs should be emphasized in the '80s, whether existing training or retraining programs are adequate, the skill areas in which personnel shortages can be forecast, whether industry can improve its adoption of new technologies, the role of small business in reindustrialization and whether the tax code should be revised to increase investment.

One of the plan's sponsors, Rep. Toby Moffett (D-Conn.), said the committee is necessary because "all the committees in the House have legislative jurisdictions which can attack the discrete segments of these problems. But there does not exist a forum for discussing the issues which cross committee jurisdictions." He added, "There is no central policy panel within the Congress that can build the coalition needed to push through a comprehensive program to deal with these issues."

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Contracts & Pacts

Systems Management American Corp. has been awarded a contract valued at over \$150 million by the U.S. Navy for the development of a new computer system to be used on most U.S. Navy ships. The computer system, Snap II (shipboard nontactical automated data processing), is being designed to assume shipboard manual administrative and management operations.

Xebec Systems, Inc. will supply an undisclosed number of S1410 5.25 Winchester disk controllers to Alpha Micro, Inc. under terms of a one-year contract valued at \$1.3 million.

Cableshare, Inc. of London, Ontario, has entered into an agreement with Northern Telecom Canada, Ltd. to provide its LSI-X.25 concentrator on a nonexclusive basis. The concentrator will be used in conjunction with Northern Telecom's SL-10 packet-switching system.

Amnet, Inc. and Paradyne Corp. have signed a five-year distribution and manufacturing agreement under which Paradyne will add Amnet products to its line of networking products.

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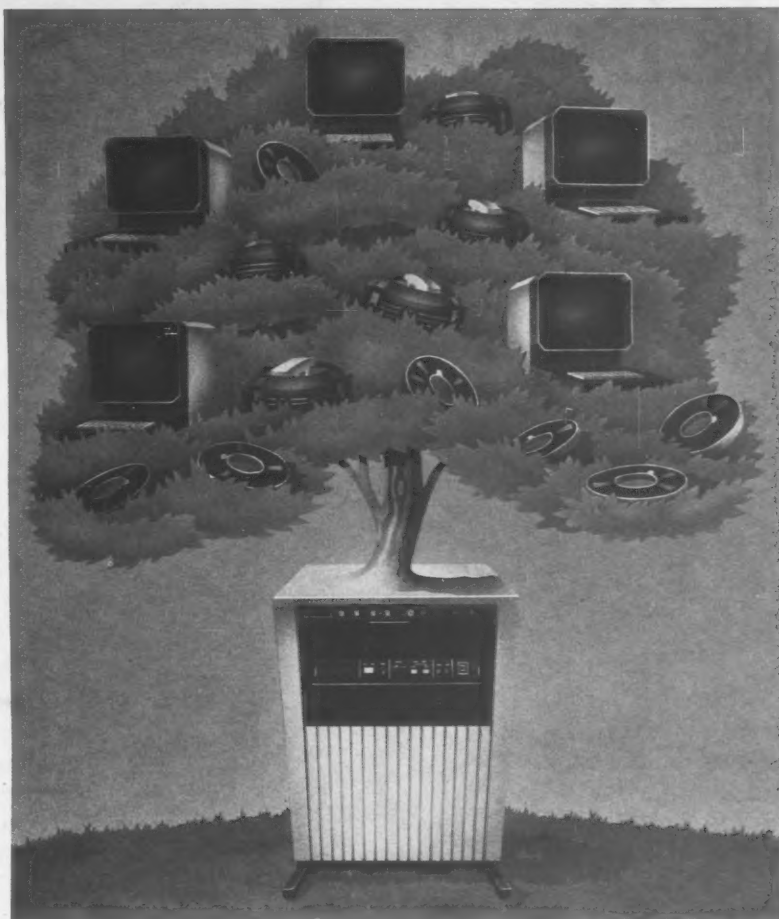
It manages all the support functions automatically. Concurrency control. Automatic rollback and recovery. On-line reorganization. Database integrity. All features to cut development time, leaving programmers free to concentrate on the applications. And score big gains in productivity.

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The 3210 gives you a choice of disc options from 32MB to 300MB. And the system supports 800, 1600 and 6250 bpi tape drives.



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By now, everyone understands the need for standard communications protocols. Without them, an electronic Tower of Babel would surely ensue. But there have to be different standards for different networks. A local-area network is different from a wide-area network. A public network is different from a private one.

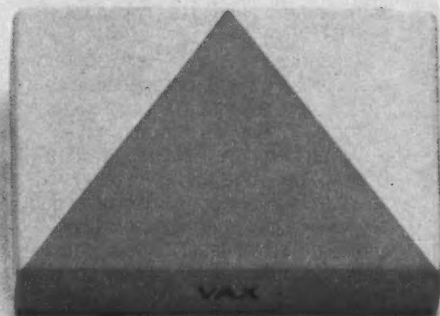
No single universal standard has emerged. Nor is one likely to. There are simply too many diverse networking environments, each fulfilling specific, mutually exclusive needs.

That's why Digital is committed to supporting and, in fact, actively promoting the more important standards now surfacing in the various environments.

Our goal is to offer our customers a range of standards to achieve any combination of networking objectives. And we've been pursuing that goal for many years.

A forward-thinking strategy.

When we first developed our networking architecture, we understood the need for flexibility.



We consciously adopted an architectural strategy that would allow our networking software to

work freely with a wide range of protocols, including some that didn't even exist at the time.

The success of that strategy is now becoming apparent. As more vendors enter the networking field, Digital is uniquely positioned to offer compatibility with the emerging protocols. We've gone farther than anyone to assure that your options are open.

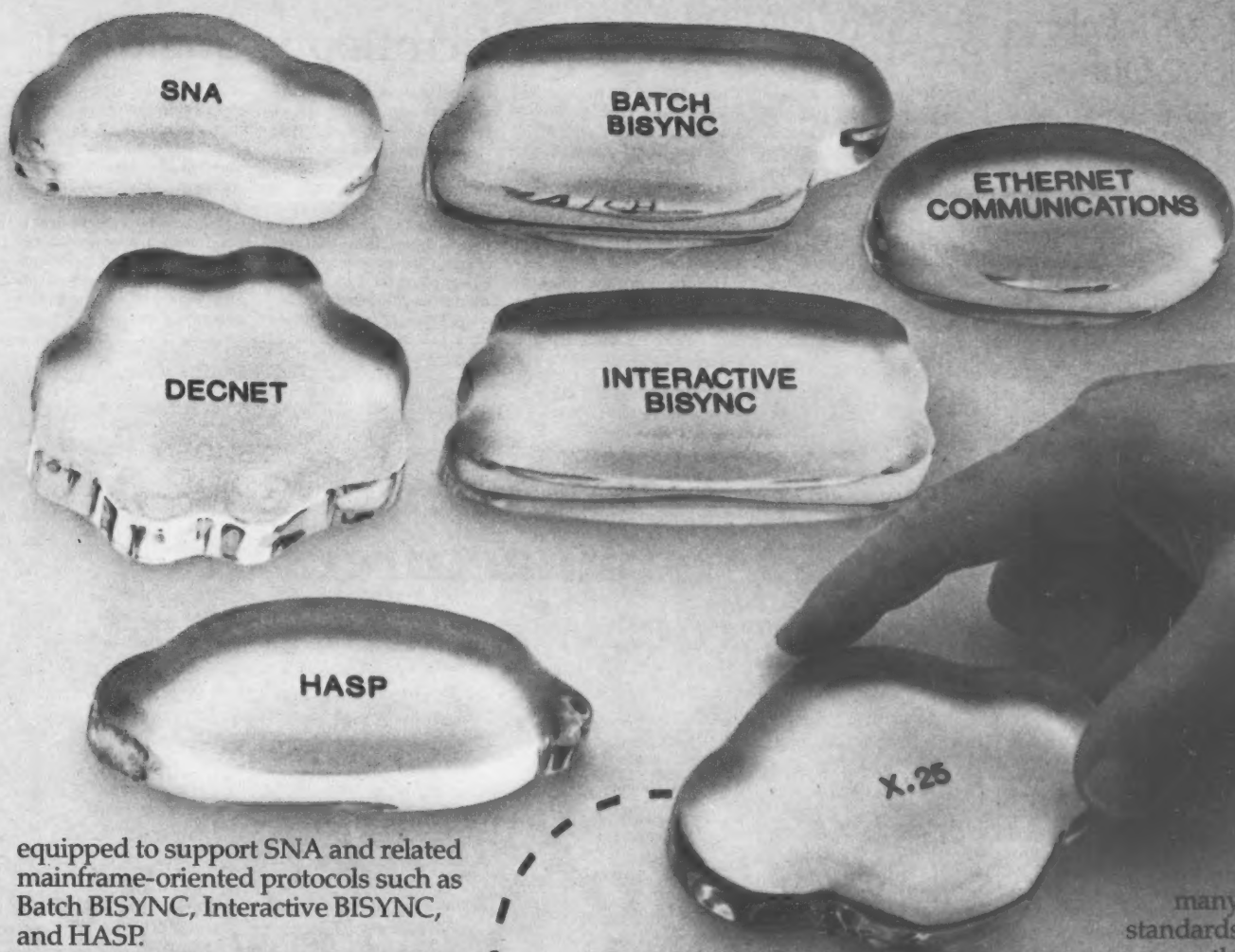
X.25 and other public networks.

Digital offers the X.25 protocol for use with public packet-switched networks such as Datapac (Canada), Transpac (France), and PSS (U.K.).

But when used with our computers, X.25 is much more than a simple link. We can provide you with the higher-level protocols that will take your systems beyond mere communications and into the sophisticated functionality that has made us a leader in networking software.

Hierarchical networks.

Even though we prefer to implement more flexible distributed networks, we are amply



equipped to support SNA and related mainframe-oriented protocols such as Batch BISYNC, Interactive BISYNC, and HASP.

Local-area networks.

Digital is one of the original sponsors of the EthernetTM* specification that has been adopted by a number of computer, semiconductor, and office equipment manufacturers. We recognized early on the need for highly reliable local-area networks. We were in on the ground floor of the definition, development and, now, the implementation of the Ethernet specification.

Distributed data processing networks.

DECnetTM, Digital's proprietary networking software, is based on a layered architecture. This is the same architectural approach followed in the model proposed by ISO. Our DECnet offers a wide range of quality networking products, products that allow such sophisticated options as adaptive path routing, down-line loading, and enhanced network management capabilities.

And so on.

We have listed a few of the

PROTOCOL

many standards we are currently supporting. There are more.

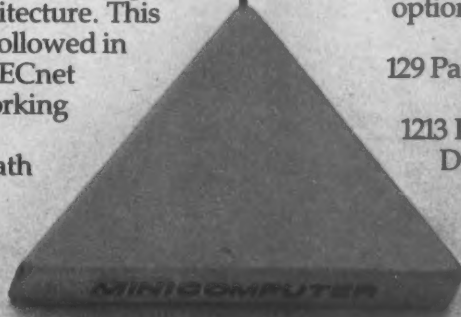
But even more important than the number of protocols is the attitude we have toward them.

We are determined to help you meet any kind of networking objective. And our capabilities in that regard are as far-reaching as they are farsighted. So if you're planning a network, don't make the mistake of planning just for the present. Talk to the people who can meet your current needs and still keep your options open for the future. Talk to us.

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Nickels & Dimes

Business and Professional Software, Inc. has completed its first venture capital financing agreements. The firm will receive in excess of \$300,000 from Eastech Associates of Boston and has arranged a \$400,000 line of credit with the Arlington Trust Co., Arlington, Mass.

\$\$\$

Intecom, Inc. has filed a registration statement with the Securities and Exchange Commission (SEC) for its initial public offering of approximately 1,885,000 shares of common stock, of which 1,250,000 shares will be sold by the company and 635,000 shares by certain shareholders. The offering is planned for late October and will be managed by Lehman Brothers Kuhn Loeb, Inc. and Hambrecht & Quist.

\$\$\$

Advanced Micro Devices, Inc. has announced a three-for-two stock split in the form of a 50% stock dividend.

\$\$\$

Corvus Systems, Inc. is offering 2,500,000 shares of common stock at \$13 per share through an underwriting group managed by Dean Witter Reynolds, Inc. and Montgomery Securities. Proceeds from the sale will be used for repayment of bank debt, capital expenditures and working capital.

\$\$\$

Data Terminal Systems, Inc. has signed a three-year revolving credit agreement with its bank group, which includes Bank of New England; Citibank, N.A.; Manufacturers Hanover Trust Co.; Security Pacific National Bank; the First National Bank of Boston; and the First National Bank of Chicago. The group will provide the company with a credit line of approximately \$30 million.

\$\$\$

The Ultimate Corp. announced the private placement of \$6,300,000 worth of units of limited partnership interest in Ultimate Development Partners, Ltd., a research partnership formed to develop two add-on products for its minicomputer system.

Eleven Firms Want 3½-In. Disk Format

Ansi Asked to Adopt Microfloppy Standard

SAN JOSE, Calif. — At least 11 magnetic media and disk drive companies have recommended that the American National Standards Institute (Ansi) adopt a 3½-in. standard format for 3½-in. microfloppy disks.

Companies sponsoring the standard, which collectively form the Micro-Floppy Standards Committee, are: Memorex Corp., Dennison Kybe

Corp., Luctor Corp., the Remex Division of Ex-Cell-O Corp., Verbatim Corp., BASF Systems Corp., Xidex Corp., Brown Disc Manufacturing, Inc., Shugart Associates, Inc., Microperipherals, Inc. and Olivetti Peripherals Equipment (a subsidiary of Ing. Olivetti & Co.).

The standard, the committee contends, will lower manufacturing costs, spur

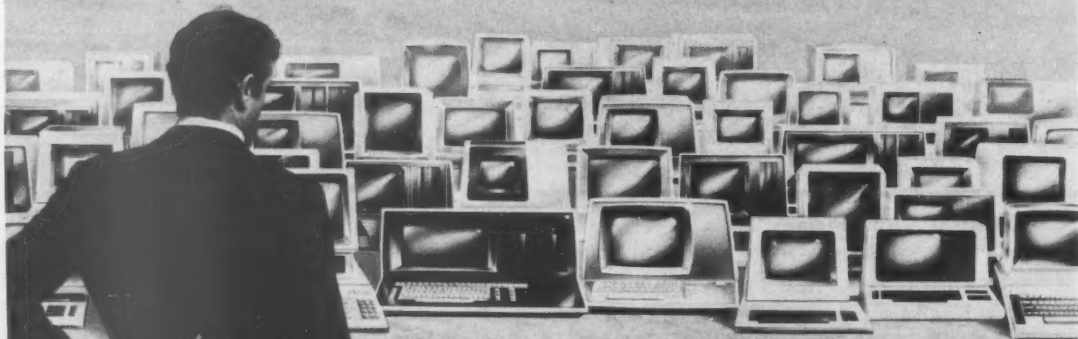
competition and increase the vendors' productivity by allowing focusing of efforts on standardized products.

The committee recommended the standard be plug-compatible with current minidisk products. The standard specifies that microdisks be constructed with either 40 or 80 track/side in single- or double-sided formats. The highest capacity 80

track/side, double-sided version could have an unfurnished capacity of 1M byte. The committee also recommended the Ansi microdisk standard incorporate an automatic shutter.

The standard was developed after a four-month review of technical presentations by several American and Japanese vendors, the committee said.

There are more than 50 manufacturers of word processing equipment.



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Xerox to Acquire Insurance Holding Firm

STAMFORD, Conn. — In a move designed in part to bolster investment income potential, the board of directors at Xerox Corp. has signed an agreement to acquire Crum & Forster Corp., a business insurance holding company, for \$1.65 billion in cash and Xerox stock.

If the acquisition is approved by shareholders and regulatory agencies, the world's leading supplier of

copiers, duplicators and printers will be diversifying into uncharted waters, as Xerox has no previous experience in the property/casualty insurance field.

Xerox officials said the move will not detract from the company's commitment to the office automation market, adding that the acquisition will not drain resources earmarked for that area.

Xerox shareholders appar-

Mergers & Acquisitions

ently did not share management's optimism when the acquisition was announced, as company stock fell over \$3 the day of the announcement. But by week's end the issue had recouped most of its earlier losses, trading in the \$33 range.

Reacting to the proposed

transaction on the other side of the ledger, Crum & Forster Chairman B.P. Russell said, "Xerox is a top-quality company and will provide us with a structure within which we can pursue new, exciting opportunities."

Russell will sit on the Xerox board once the acquisition is

approved. Crum & Forster, the country's 15th largest property and casualty insurer, will continue as a separate subsidiary under its present management.

Other Moves

Wesperc Corp. has completed the acquisition by merger of California Minicomputer Systems, Inc. (CMS). Shareholders of CMS received 264,000 shares of Wesperc Corp common stock. CMS will operate as a subsidiary of Wesperc.

The merger of Olivetti Corp., Tarrytown, N.Y., into Docutel Corp. has been completed following approval by Docutel's stockholders. The company has been renamed Docutel/Olivetti Corp. With the merger, The Olivetti Group's equity interest in Docutel has been increased to 46%. Olivetti may also exercise a warrant to purchase an additional 500,000 Docutel common shares at \$32 per share between Jan. 1 and June 30, 1984.

New Companies

The Computer Revolution, Inc. is a company formed by George Matyjewicz and Co. to market complete micro-computer systems to small- and middle-size businesses. The firm is located at 247 N. Plank Road, Newburgh, N.Y. 12550.

Primages, Inc. is a company specializing in the manufacturing and marketing of high-speed, letter-quality daisy printers. The firm's headquarters are located in Bohemia, N.Y.

C&L Systems, Inc. is a firm dedicated to providing complete labor-saving software tools for the Hewlett-Packard Co. HP 1000 line of technical computers. It is located at 55 Peach Tree Court, Hawthorne, N.J. 07506.

Essential Resources is a firm offering training on Digital Equipment Corp. software. The firm specializes in tailored, on-site courses for DEC customers. The firm is located at Suite 38, 40 W. 24th St., New York, N.Y. 10010.

There are lots of famous names. And some not-so-famous names. But none have all the advantages of Compucorp.

First, Compucorp has one of the widest product lines available of any word processor manufacturer. It means greater selection. And because of Compucorp's modular design approach, any member of the Compucorp family can be upgraded. Virtually no other manufacturer can say this. Upgrading equipment, rather than buying new equipment, can save you a bundle.

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Add to all of this the fact that Compucorp has a worldwide sales and service organization, and has manufactured hundreds of thousands of computer-based products during its 13-year history.

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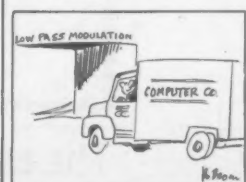
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Supershorts

Sperry Univac has signed a licensing agreement with Management Science America, Inc. (MSA) to market MSA's financial, cash management and human resources software systems to users of Univac 1100 computers.

The Service Bureau Co. has changed its name to Control Data Business Centers, Inc.

Job Organization Language (JOL), the command language for all OS and OS-compatible systems, now supports a non-IBM OS-compatible system, OSIV/X8 from Fujitsu, Ltd., enabling Fujitsu's X8 users to make the conversion to MVS or Fujitsu's OSIV/F4 transparent.

Hewlett-Packard Co. will form a new division Nov. 11 from its Colorado Springs Division. The new division, Logic Systems, will be drawn from the three-year-old logic systems operation within the existing division and will share quarters with Colorado Springs.

Intel Corp. has formed a centralized Software Distribution and Support Operation (SDSO). SDSO will provide systems-level support and distribution for third-party software and support for Intel's software on a contractual basis. The new division is a successor to Intel's software distribution operation.

Tymshare, Inc. and Italcable USA,

DEC Freezes Salaries for Quarter

MAYNARD, Mass. — Digital Equipment Corp. has delayed for three months salary reviews for all of its 67,000 employees. This marks the second belt-tightening measure the company has taken this year, according to DEC spokesman Peter Connell — the first being a companywide hiring freeze instituted at the beginning of this year.

The delay will affect each employee differently as the three-

month period is applied to each worker's individual review schedule. If an employee is due for a review in April, he will now have to wait until July. "We're just building in a three-month deferral to the process," Connell said.

The recession was cited as the reason for this measure. "It's to protect the long-term viability of the company," Connell said. "The length and depth of the recession is affecting our customers."

Inc. have formed a joint-venture company to market automated travel reservation services. The new firm will integrate the electronic reservation services of Tymshare Travel Management Services communica-

tions via Tymnet and the resources of Italcable, the Italian international telecommunications operating carrier, which is the parent company of Italcable USA.

Racal-Redac, Inc. has established a technical evaluation center that will be responsible for product testing and evaluation, product planning and design specifications development.

Dataram Corp. has reduced its work force by 15%. The reduction was mainly in personnel engaged in manufacturing core memory products, reflecting the continued decline in revenues from those products.

The computer systems manufacturing operation of Zilog, Inc. has resumed a five-day work week. The division had placed approximately 100 people on a four-day work schedule July 19 in order to reduce the division's inventories.

Evans & Sutherland Computer Corp. has donated PS 300 computer graphics systems to 14 universities using computer graphics in a variety of research and educational disciplines. The schools include Case Western Reserve University, Colorado State University, University of Minnesota, Michigan State University, Arizona State University, University of Illinois, University of Washington, University of Arizona, Washington University, University of California at Santa Cruz, University of Houston, Brigham Young University, Brown University and Princeton University.

Capital Holding Corp. is giving \$250,000 to Bellarmine College to aid the development of the school's computer science program. The grant will be used to establish the "Capital Holding Chair of Computer Science."

Timberline Systems, Inc., a specialist in minicomputer-based products, will begin marketing software for the microcomputer market. The first product, "Timberline Spreadsheet," is currently under evaluation by several hardware vendors.

The Association of Data Processing Service Organizations, Inc.'s fellowship/grant program has made awards to 21 students to help finance their education in computer science. The students were selected from hundreds of applicants on the basis of academic and personal achievements, faculty recommendations and financial need.

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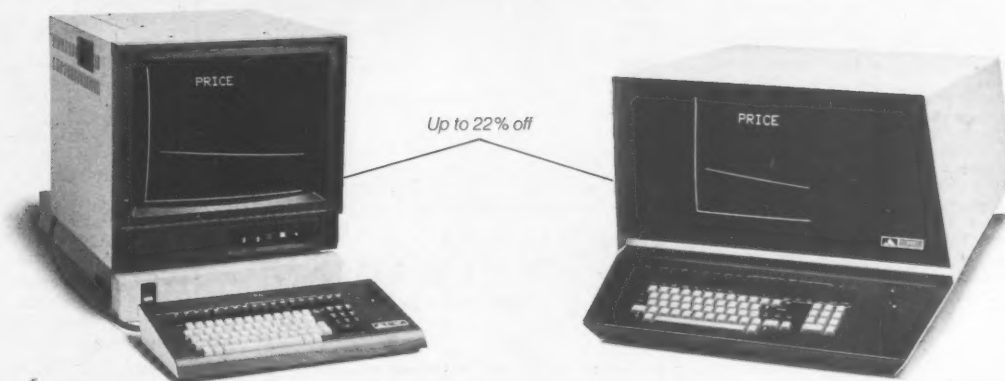
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Slow Sales Trigger Honeywell Exec's Demotion

MINNEAPOLIS — Steven G. Jerrits, president of the Information Systems Division of Honeywell, Inc. since 1980, has been demoted to senior vice-president in that division.

At the same time, the Honeywell board of directors announced the promotion of Dr. James J. Renier to vice-chairman of the company and president of the Information Systems Division.

The Jerrits demotion follows four consecutive quarters of lower earnings for the company, which produces the DPS 8, Level 64 and Level 66 large computer systems; the DPS 7 medium-scale computer; and the DPS 6 minicomputer. Lower than expected sales, particularly in the mini side of the business, have led to the

Executive Corner

layoff of approximately 1,800 employees nationwide in the Information Systems Division since last October.

In his new capacity, Jerrits will be on roughly the same reporting level as group vice-presidents Jerome J. Meyer and Richard Douglas, a Honeywell spokeswoman said. Previously, Meyer and Douglas had reported to Jerrits.

Honeywell released a carefully worded statement saying the changes were made "in order to

bring new ideas and technology to the business and in order to position Information Systems for later decades."

Renier, 52, has been with Honeywell since 1956. He has been president of the company's Control Systems Division since 1978. In the past, he has served as vice-president and general manager of Honeywell Data Systems Operations and as group vice-president for the Aerospace and Defense Group.

Other Moves

• John T. Riley has been appointed president and chief executive officer of the Kalvar Corp.

• Mitchell J. Laskey has been appointed executive vice-president;

Tom Stutzman, vice-president, personnel; Dr. Gloria D. Garbin, vice-president, Pharmacy Division; and Joan Sahrman-Groves, vice-president, field operations for Dynamic Control Corp.

• Carmin E. Lynch has been named vice-president, manufacturing, for Burroughs Corp.

• Donald V. Bateman has been elected vice-president, human resources, and James A. Pitts, vice-president, controller for Data General Corp.

• Dr. Edward Thompson has been appointed senior vice-president; Ronald Dorst, vice-president, Digital Division; and Dr. Charles Holmes, vice-president, Microwave Division of Comsat General Integrated Systems.

• Hugh Wagner has been appointed vice-president, director of marketing, for Videotex America.

• Dennis A. O'Donnell has been appointed a vice-president of C3, Inc. and president of its MPC Division.

• Richard C. Murland has been named vice-president of U.S. sales for Intertel, Inc.

• Charles Babbitt has been named divisional vice-president and general manager of CSG Corp., a unit of Canada Systems Group's Processing Services Group.

• Michael A. Taback has been appointed vice-president of engineering for Computer Aided Engineering, Inc.

• Patrick J. Lusey has been appointed vice-president of sales for Micro Business Software, Inc.

• William M. Sheeser has been named executive vice-president of marketing and sales for Manof Communications Systems, Inc.

• David J. Guzman has been appointed vice-president of marketing and strategic planning for Zilog, Inc.

• S. Richard Rausch has been appointed vice-president of the Qantex division of North Atlantic Industries, Inc.

• Jack G. Milne has joined Data-point Corp. as vice-president, corporate relations.

• Peter Gyenes and Dr. Fontaine Richardson have been named to the board of directors of Business and Professional Software, Inc.

• Willis K. Drake, chairman of the board of Data Card Corp., has been elected to the board of directors of Analysts International Corp.

• Jan Lindelow has been appointed vice-president, worldwide industry marketing and applications development, for Sperry Univac.

• Frank Kirchhoff has been promoted to division vice-president of North American sales of Cipher Data Products, Inc.'s OEM marketing division.

• Edward J. Clark has been appointed vice-president, marketing, and Robert E. Oldenburg has been named vice-president, domestic sales, at NCR Comten, Inc.

• David McKearnan has been elected to the board of directors of Donaldson, Lufkin & Jenrette Securities Corp.

• Dr. James J. Renier has been elected vice-chairman of the board of directors of Honeywell, Inc.

COMMUNICATION NETWORKS '83

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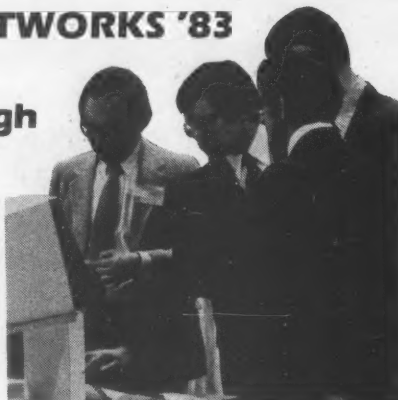
• **General Sessions:** Opportunities for users, carriers, vendors and business and policy makers — with over 70 sessions on telecommunications, resource management, investment and justification, cost containment and new applications through high technology networks. **Special interest topics** include the use of satellite communications, local area networks, packet networks, network interconnection, teleconferencing, electronic mail and telecommunications requirements for the "office of the future."

• **Application seminars** emphasize user case-history presentations on such areas as systems requirements, selection of vendors, contracting and user follow-up. Special attention will be given to **electronic mail and office communications (EM/OC)** at CN '83. Business generalists as well as telecomm pros will benefit from seminars on basic to advanced applications with industry specific case histories.

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Registration for the conference program is \$395. For the In-depth seminars, the cost is \$275 including lunch and text.

There will be something for everyone during these three days of conference and exposition at The Rivergate in New Orleans. Exposition hours are 10 a.m. to 4 p.m. on Monday, January 31 and Tuesday, February 1 and from 10 a.m. to 2:30 p.m. on Wednesday, February 2.



Lunch is complimentary each day to registered attendees, right in the hall, so you can check out new product ideas, meet old friends and renew contacts on the spot. Or, maximize your on-site idea time — jog early and meet for 7:30 a.m. "Early Bird Rap Sessions" which include coffee and pastry.

Register now by calling Louise Myerow, Registration Manager toll free 800-225-4698 (617-879-0700 in Mass.). For exhibit information, call or write Judie McDaid, Hajar Associates, 280 Hillside Ave, Needham Heights, MA 02194, 617-444-3946.



The Rivergate New Orleans, Louisiana January 31-February 2, 1983

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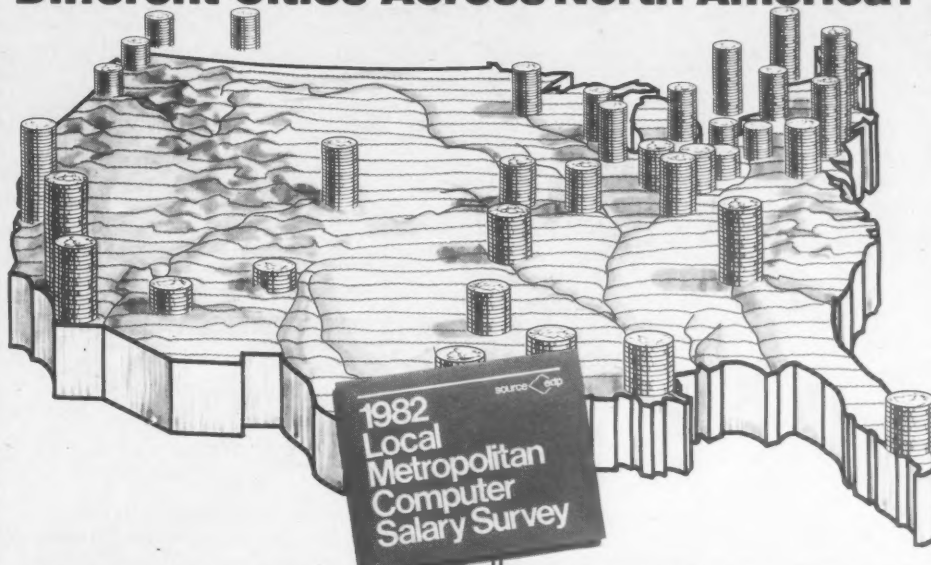
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Salary range is in the 30's. For full consideration applications and nominations should be received before October 29, 1982 and should be sent to:

Dr. Donald L. Hartford
Director of Academic Computing
1015 Floyd Avenue
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Applicants must include a curriculum vitae and the names and telephone numbers of at least three persons whom the search committee can turn for assessments of the candidate's strengths and experience.

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Private four-year college in western Massachusetts seeks Systems Analyst who has demonstrated communications and business skills in that position in an on-line system, preferably but not necessarily in a college or university environment, ideally specializing in systems development and implementation. Sound knowledge of COBOL required; RPG programming, IBM S/36 experience desirable. B.S. or Master's in Business Administration also desirable. Please send resume stating qualifications and experience.

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Positions involve developing and maintaining interactive systems software using large scale IBM/VM/SP, OS/MVS, JES2, CICS, DBMS, SNA, DP (RJE & interactive) systems in a distributed EDP environment. Minimum 3 yrs. experience with these systems. Degree required.

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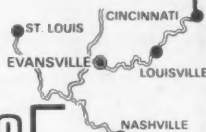
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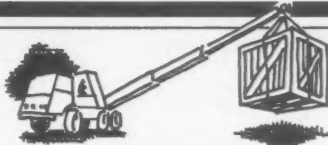
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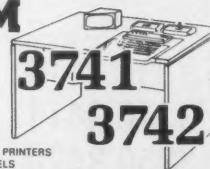
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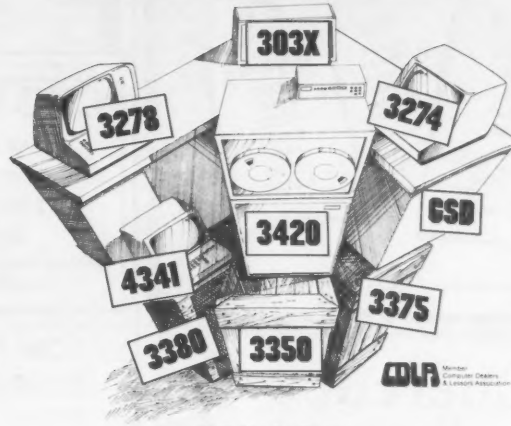
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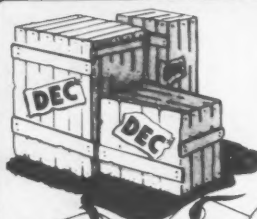
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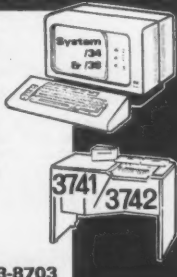
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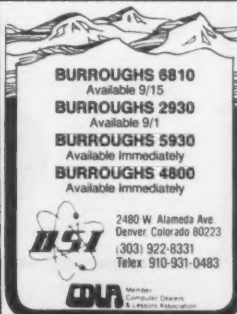
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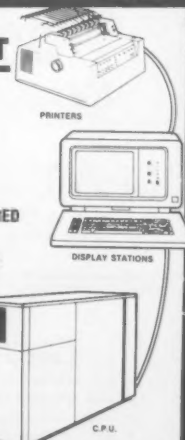
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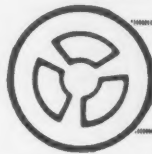
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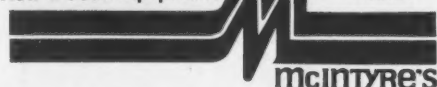
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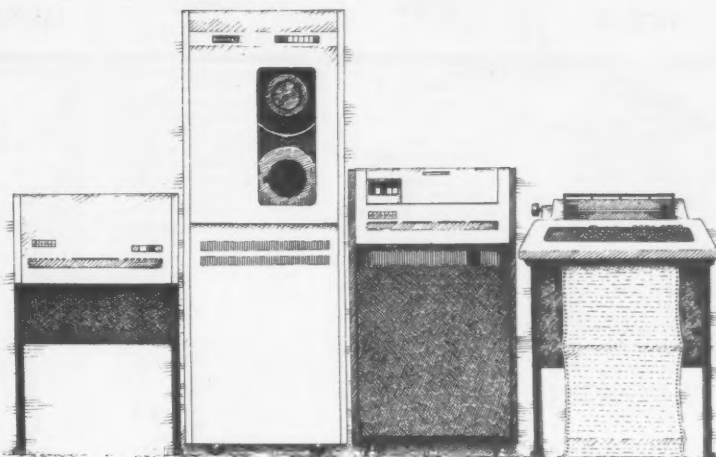
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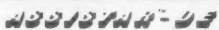
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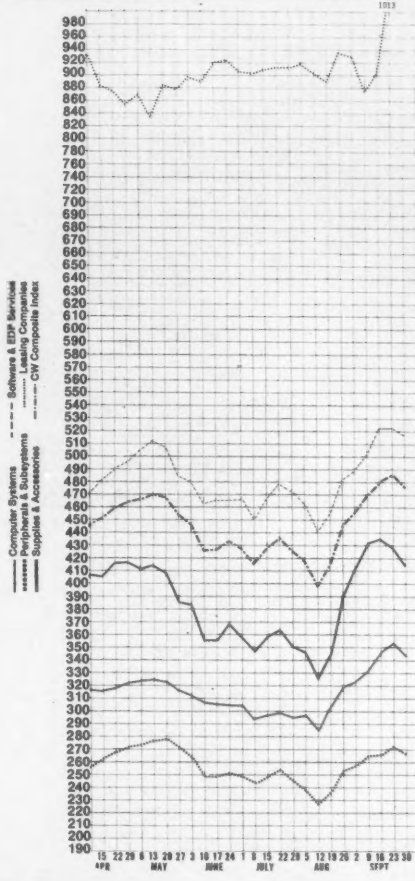
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CLOSING PRICES WEDNESDAY, SEPTEMBER 29, 1982

All statistics compiled, computed and formatted by TRADE QUOTES, INC. Cambridge, Mass. 02139

| PRICE | | | | | PRICE | | | | | PRICE | | | | |
|--------------------------|---------|--------|--------|--------|------------------------------|---------|--------|--------|--------|------------------------|---------|--------|---------|--------|
| | 1981-82 | CLOSE | WEEK | WEEK | | 1981-82 | CLOSE | WEEK | WEEK | | 1981-82 | CLOSE | WEEK | WEEK |
| X | RANGE | SEP 29 | NET | PCT | X | RANGE | SEP 29 | NET | PCT | X | RANGE | SEP 29 | NET | PCT |
| C | (1) | 1982 | CHANGE | CHANGE | C | (1) | 1982 | CHANGE | CHANGE | C | (1) | 1982 | CHANGE | CHANGE |
| COMPUTER SYSTEMS | | | | | | | | | | | | | | |
| A ANDAHL CORP | 18-48 | 28 1/8 | -1 | -3.6 | D ADVANCED CORP TECH | 1-6 | 1 3/4 | 0 | 0.0 | A COMPUTER CONSOLES | 18-28 | 23 | -1/2 | -2.1 |
| D BURGHOUS CORP | 28-72 | 36 1/8 | + 1/2 | +1.4 | D ADVANCED SYSTEMS INC | 3-15 | 11 | -1/2 | -4.3 | D COMPUTER DEVICES INC | 4-12 | 12 | -1/8 | -1.0 |
| D COMPUTER AUTOMATION | 8-28 | 8 5/8 | -3/8 | -3.7 | D AGS COMPUTERS INC | 7-10 | 9 1/8 | -1/8 | -1.3 | D COMPUTER TRANSCIVER | 3-9 | 4 3/8 | + 1/8 | +2.5 |
| N CONTROL DATA CORP | 19-42 | 28 | -3/4 | -2.5 | D ANACORP INC | 10-18 | 13 3/4 | +1 3/8 | +13.2 | N COMPUTERVISION CORP | 20-48 | 22 | -1 7/8 | -7.8 |
| N CRAY RESEARCH INC | 20-48 | 23 7/8 | -5/8 | -2.5 | D ANALYSTS INTL CORP | 3-14 | 6 | 0 | 0.0 | D CONARC CORP | 17-28 | 26 5/8 | + 5/8 | +0.4 |
| N DATA GENERAL CORP | 21-67 | 25 3/8 | -1 | -3.7 | A APPLIED DATA RES. | 12-28 | 17 1/2 | -1 5/8 | -7.7 | D DATA ACCESS SYSTEMS | 2-8 | 2 | 0 | 0.0 |
| N DATAPoint CORP | 11-68 | 13 5/8 | -1 1/8 | -7.8 | D ASK COMPUTER SYSTEMS | 11-18 | 17 1/8 | -3/4 | -4.1 | A DATAPRODUCTS CORP | 18-44 | 22 7/8 | + 1/8 | +2.6 |
| D DIGITAL EQUIPMENT | 62-113 | 80 3/4 | -4 3/4 | -5.5 | D ASTRAIDYNE CORP | 1-5 | 1 1/4 | 0 | 0.0 | D DATAPARC CORP | 4-15 | 6 3/8 | -1/8 | -1.9 |
| A EECO INC | 6-18 | 8 1/2 | -1/4 | -2.8 | N AUTOMATIC DATA PROC | 21-32 | 24 1/2 | + 5/8 | +2.6 | D DATA RESEARCH | 2-8 | 2 | -1/8 | -5.8 |
| N ELECTRONIC ASSOC. | 5-13 | 8 7/8 | -3/4 | -7.7 | D CGA COMPUTER ASSOC | 4-25 | 3 3/4 | 0 | 0.0 | D DAVID JARISON CARLYL | 2-7 | 2 3/4 | -1/8 | -4.3 |
| N FLOATING POINT SYST | 13-30 | 25 1/2 | -1 7/8 | -6.8 | D COMPUTER ASSOC INT'L | 12-26 | 23 1/2 | -1 | -4.0 | D DECISION DATA CORP | 3-6 | 4 7/8 | -5/8 | -11.3 |
| N FORBORD | 22-62 | 31 1/4 | -3/8 | -1.1 | D COMPUTER HORIZONS | 1-3 | 2 | 0 | 0.0 | D DELTA DATA SYSTEMS | 1-4 | 1 | -1/8 | -11.1 |
| D FULCRUM CORP GRP | 1-8 | 1/4 | 0 | 0.0 | D COMPUTER NETWORK | 4-9 | 7 7/8 | +5/8 | +8.6 | D ELECTRONIC R & M | 3-8 | 4 1/8 | 0 | 0.0 |
| D GENERAL AUTOMATION | 3-18 | 3 1/2 | -1/8 | -3.4 | N COMPUTER SCIENCES | 11-30 | 15 | -5/8 | -4.0 | D EVANS & SUTHERLAND | 18-40 | 28 | +1/2 | +1.7 |
| N HARRIS CORP | 21-60 | 34 1/2 | -1/2 | -1.4 | D COMPUTER TASK GROUP | 8-23 | 8 1/4 | -1/2 | -5.1 | D GANDALF TECHNOLOGIES | 10-15 | 14 1/4 | +5/8 | +4.5 |
| N HEALITT-PACKARD CO | 33-55 | 32 5/8 | -2 | -6.6 | D COMPUTER USAGE | 2-10 | 2 1/8 | -1/4 | -10.5 | N GEN'L DATA CORP IND | 7-19 | 10 1/4 | -1/8 | -1.2 |
| N HONEYWELL INC | 60-115 | 80 | -3 5/8 | -4.3 | D COMPUTONE SYSTEMS | 12-24 | 24 3/8 | +1 7/8 | +8.3 | D GENERAL TERMINAL CP | 0-4 | 1/4 | 0 | 0.0 |
| N IBM | 48-77 | 74 3/4 | -3/4 | -0.9 | D CONSERV CORP | 8-18 | 15 1/4 | +1/4 | +1.6 | D GREAT SOUTHWEST INC | 1-12 | 2 3/4 | -1/4 | -8.3 |
| D IPL SYSTEMS INC | 5-13 | 8 | 0 | 0.0 | D COSHARE | 6-21 | 8 | +1/4 | +4.3 | N HAZELTINE CORP | 18-35 | 23 3/8 | -5/8 | -2.0 |
| D MAGNUSON CORP SYSTS | 2-32 | 1 5/8 | -1/4 | -13.3 | N CULLINANE DATABASE | 15-41 | 39 3/8 | -1 5/8 | -3.8 | | | | | |
| N MANAGEMENT ASSIST | 7-28 | 8 | -3/8 | -4.0 | D CYCARE SYSTEMS INC | 9-14 | 10 3/4 | -1/4 | -2.2 | D ICOT CORP | 3-4 | 3 | 0 | +2.1 |
| D MINI-COMPUTER SYST | 1-8 | 3/8 | 0 | 0.0 | D DATA DIMENSIONS INC | 1-3 | 1/4 | 0 | 0.0 | D INFORMATION INTL INC | 9-17 | 14 1/2 | +1/4 | +1.7 |
| N MODULAR COMPUTER SYS | 7-32 | 8 3/4 | -1/8 | -1.2 | D DATATAB | 1-4 | 5/8 | 0 | 0.0 | D INTEL CORP | 21-55 | 33 1/4 | -1 | -2.8 |
| N RIMARK DATA SCI | 10-32 | 14 | -5/8 | -4.2 | D DYNATRON | 2-11 | 3 | -1/4 | -7.8 | D IPL SYSTEMS INC | 5-15 | 6 | 0 | 0.0 |
| N NCR | 38-78 | 84 1/4 | -3 7/8 | -5.9 | N ELECTRONIC DATA SYST | 13-35 | 34 1/8 | +1/8 | +0.3 | A LUNDY ELECTRONICS | 7-18 | 8 1/2 | -1/2 | -5.0 |
| N PERKIN-ELMER | 17-36 | 24 | +3/4 | +1.5 | D INFORMATICS INC | 10-23 | 14 7/8 | -1/2 | -3.2 | N RUS DATA CORP | 11-27 | 10 3/8 | +1/4 | +1.3 |
| N PRIME COMPUTER INC | 16-48 | 24 3/4 | -3/4 | -2.8 | D INSYTE CORP | 1-3 | 1 5/8 | 0 | 0.0 | D NETWORK SYSTEMS CORP | 14-26 | 24 5/8 | +5/8 | +2.8 |
| N SENTRY CORP | 21-65 | 23 1/8 | -1 | -4.1 | D INNOVATIVE COMPUTER MARKET | 1-3 | 1 1/8 | 0 | 0.0 | D OREX | 3-8 | 3 | 0 | 0.0 |
| D TANDEN COMPUTERS INC | 13-35 | 23 | -3/4 | -3.1 | D KEANE ASSOCIATES | 4-8 | 4 1/4 | -1/8 | -5.5 | N PHOENIX CORP | 24-52 | 32 7/8 | -3 3/8 | -9.3 |
| N TEXAS INSTRUMENTS | 71-151 | 93 3/8 | -4 5/8 | -4.7 | A LOGICON | 12-38 | 20 1/2 | +1 7/8 | +10.0 | D RANTER CORP | 9-23 | 14 1/4 | -1/2 | -12.3 |
| A WANG LABS "B" | 24-38 | 36 1/4 | -1 3/4 | -4.6 | D MATHEMATICAL SCI APPR INC | 8-17 | 15 | -1/4 | -1.6 | N SCAN DATA | 1-3 | 1 1/4 | 0 | 0.0 |
| A WANG LABS "C" | 21-40 | 37 | -1 1/2 | -3.8 | D MATHEMATICAL INC | 8-17 | 15 | -1/4 | -1.6 | N STORAGE TECHNOLOGY | 16-40 | 18 3/4 | -1 1/4 | -8.2 |
| | | | | | D NATIONAL DATA CORP | 12-28 | 17 7/8 | -1 5/8 | -5.2 | N SWISS DATA SYSTEMS | 5-35 | 23 1/2 | -1 1/2 | -6.0 |
| | | | | | D PANSOPHIC SYSTEMS | 8-15 | 13 3/4 | -3/4 | -5.1 | A T BAR INC | 7-19 | 7 1/2 | -5/8 | -7.6 |
| | | | | | N PLANNING RESEARCH | 5-13 | 8 1/8 | -1/8 | -1.5 | A TEC INC | 4-11 | 8 3/8 | -1/8 | -1.4 |
| | | | | | D PROGRAMMING & SYS | 1-2 | 1 1/4 | 0 | 0.0 | N TEKTRONIX INC | 26-70 | 41 | -10 3/4 | -25.7 |
| | | | | | D REYNOLDS & REYNOLD | 16-28 | 23 | 0 | 0.0 | N TELES | 3-17 | 4 | 0 | 0.0 |
| | | | | | D SEI CORP | 17-28 | 27 1/2 | -1/2 | -1.7 | D TESDATA SYSTEMS CP | 3-17 | 4 | 0 | 0.0 |
| | | | | | D SHARED MEDICAL SYST | 28-39 | 36 3/8 | -1 7/8 | -4.9 | A TIMEPLEX INC | 7-15 | 11 1/4 | +3/8 | +3.4 |
| | | | | | D SCIENTIFIC COMPUTERS | 8-16 | 8 3/4 | -1/2 | -5.4 | D VISUAL TECHNOLOGY | 9-15 | 11 1/2 | -1/2 | -4.1 |
| | | | | | D SOFTWARE AG | 5-23 | 8 1/8 | 0 | 0.0 | D WILKEX INC | 1-3 | 1 1/4 | 0 | 0.0 |
| | | | | | N THYSHARE INC | 13-38 | 20 1/8 | -5/8 | -3.0 | | | | | |
| | | | | | A USR CORP | 10-18 | 10 1/2 | -3/4 | -6.8 | | | | | |
| | | | | | N WYLY CORP | 7-20 | 10 1/4 | -1/4 | -2.3 | | | | | |
| SUPPLIES & ACCESSORIES | | | | | | | | | | | | | | |
| | | | | | | | | | | N AMERICAN BUS PRODS | 11-17 | 16 1/4 | 0 | 0.0 |
| | | | | | | | | | | D BALTIMORE BUS FORMS | 1-2 | 1 | 0 | 0.0 |
| | | | | | | | | | | N BARRY WRIGHT | 14-24 | 18 1/2 | + 1/4 | +1.3 |
| | | | | | | | | | | D CYBERNETICS INC | 1-2 | 1 | 0 | 0.0 |
| | | | | | | | | | | A DUPLEX PRODUCTS INC | 12-17 | 15 3/4 | -1/4 | -1.5 |
| | | | | | | | | | | N ENNIS BUS. FORMS | 15-35 | 23 1/2 | -1 1/2 | -6.0 |
| | | | | | | | | | | D JCB COMPANY | 48-68 | 64 1/4 | -1 3/8 | -2.0 |
| | | | | | | | | | | A KODAK CORP LTD | 26-38 | 32 1/2 | -1 7/8 | -5.4 |
| | | | | | | | | | | N KODAK CORP | 9-23 | 8 3/8 | -3/4 | -7.4 |
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| | | | | | | | | | | A TAB PRODUCTS CO | 12-30 | 15 1/2 | -1 1/2 | -8.9 |
| | | | | | | | | | | N WALLACE BUS FORMS | 22-38 | 36 1/8 | -1 5/8 | -4.3 |
| PERIPHERALS & SUBSYSTEMS | | | | | | | | | | | | | | |
| | | | | | N AM INTERNATIONAL | 1-15 | 7/8 | +1/8 | +15.3 | | | | | |
| | | | | | A ANDERSON JACOBSON | 8-26 | 13 1/2 | -1/4 | -1.9 | | | | | |
| | | | | | D AUTO-TROL TECHNOLOGY | 8-22 | 11 3/8 | -3/8 | -3.8 | | | | | |
| | | | | | D BANCORP INC | 7-35 | 11 1/4 | -1/2 | -4.2 | | | | | |
| | | | | | A BEEHIVE INT'L | 4-18 | 5 | +3/8 | +8.1 | | | | | |
| | | | | | A BOLT, BERANER & NEW | 9-25 | 21 1/4 | -1 5/8 | -8.1 | | | | | |
| | | | | | D CANEX CORP | 2-9 | 2 1/4 | -1/4 | -10.0 | | | | | |
| | | | | | N CENTRONICS | 7-40 | 10 7/8 | +2 1/8 | +24.2 | | | | | |
| | | | | | A CETEC CORP | 4-8 | 4 3/8 | +1/8 | +2.7 | | | | | |
| | | | | | D COBITRONICS | 2-11 | 3/8 | +1 | +22.8 | | | | | |
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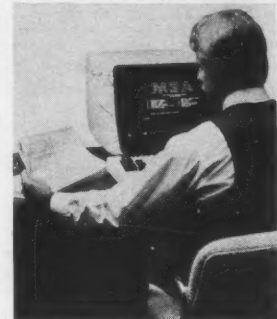
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